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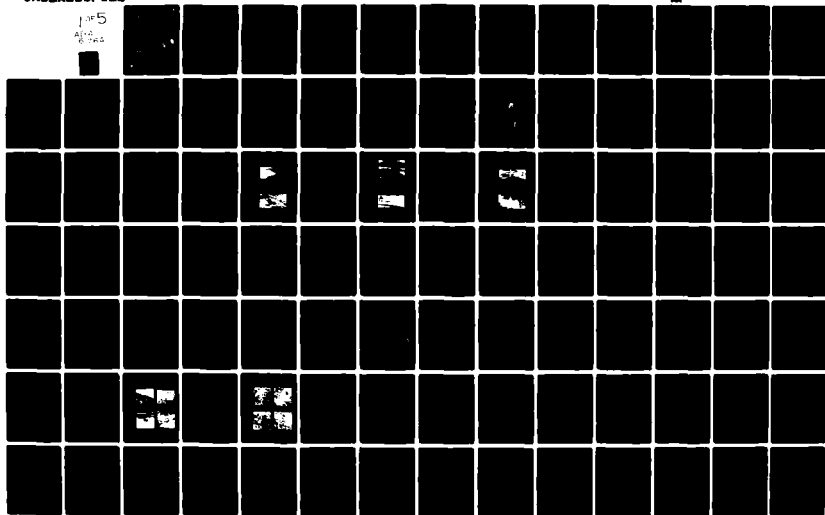
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A PRELIMINARY ASSESSMENT OF THE CULTURAL RESOURCES IN THE BRAZO--ETC(U)

NOV 81 J P THURMOND, M D FREEMAN, S L ANDREWS DACW63-81-C-0095

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**A PRELIMINARY ASSESSMENT of the CULTURAL RESOURCES in  
the BRAZOS NATURAL SALT POLLUTION CONTROL PROJECT,  
KENT, KING and STONEWALL COUNTIES, TEXAS**

by  
**J. Peter Thurmond  
Martha Doty Freeman  
and  
Susan L. Andrews**



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Block 20, continued

proposed reservoirs and an interconnecting pipeline route in the Croton, Salt Croton and North Croton creek drainages.)

The 121 prehistoric and 17 historic sites identified to date are described and are evaluated in terms of their integrity and scientific information yield potential. On the basis of these evaluations, further work is recommended at 21 prehistoric and 5 historic sites. Although the present survey was not sufficient in scope to seek determinations of eligibility for nomination to the National Register of Historic Places, 13 prehistoric and 3 historic sites may be found to be eligible on the basis of the additional work recommended. Seventy-two localities which are potentially significant to the interpretation of the history and prehistory of the area are also described.

Ancillary studies of the geology, soils and vegetation in and near the project area are combined with the cultural resources studies to provide an analysis of the prehistoric settlement patterns. Sites are typically situated on benches along valley margins, and the upper reaches of smaller tributary canyons are preferred over larger mainstem canyons. This reflects the distribution of potable water within the study area. Lithic procurement sites are found to covary with the distribution of Pleistocene or early Holocene gravel deposits. Sites are diffuse in nature and lack large quantities of cultural debris. Unstable landforms and recent erosion have contributed to the destruction or significant disruption of many sites. Temporal indicators are sparse, but occupations extending from Paleoindian through Archaic and Late Prehistoric into Historic times are identified. The most intensive use appears to have been during the late Archaic and Late Prehistoric periods.

Although Historic-period use of the study area began in the eighteenth century, identified historic sites reflect intensive exploitation of the region beginning in the late nineteenth century and extending into modern times. Sites related to ranching are predominant. However, evidence of mining activities and possibly buffalo hunting is also present.

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BRAZOS NATURAL SALT POLLUTION CONTROL PROJECT,  
KENT, KING AND STONEWALL COUNTIES, TEXAS

by

J. Peter Thurmond  
Martha Doty Freeman  
and  
Susan L. Andrews

with contributions by

Vance T. Holliday  
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Ray D. Kenmotsu  
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PRINCIPAL INVESTIGATOR: Elton R. Prewitt

REPORTS OF INVESTIGATIONS, NUMBER 18

Prewitt and Associates, Inc.  
Consulting Archeologists  
Austin, Texas

November 1981

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## FOREWORD

The results of a stratified 25 percent sampling survey of cultural resources to be affected by the Brazos Natural Salt Pollution Control Project are presented in this report prepared by Pete Thurmond, Martha Freeman and Susan Andrews. Designed as a management tool which may be used to predict potential conflicts with cultural resources, the report presents detailed information regarding the locations and characteristics of archeological and historical sites encountered during the sampling survey. The results of special studies conducted in conjunction with the archeological and historical studies are thoroughly integrated into the report to provide ancillary data related to the environment and physical integrity of the cultural resources.

Previous investigations of the cultural resources in the immediate project area are sparse. This report not only provides the Corps of Engineers with management data, but presents substantial technical information regarding archeological and historical sites which may be used by other archeologists in comparative regional studies. The authors and contributors have prepared a comprehensive report which Prewitt and Associates, Inc. are pleased to include in their Reports of Investigations series.

Elton R. Prewitt  
President and  
Principal Investigator

## ABSTRACT

The results of a 25 percent sampling survey of areas expected to be affected by the proposed Brazos Natural Salt Pollution Control Project are described. The cultural resources assessments were conducted by Prewitt and Associates, Inc. during May and June 1981 under terms of a contract with the Fort Worth District, Corps of Engineers. The project is located in Kent, King and Stonewall counties in northwestern Texas and includes portions of the Brazos River drainage basin. The areas examined include samples of three proposed reservoirs and an interconnecting pipeline route in the Croton, Salt Croton and North Croton creek drainages.

The 121 prehistoric and 17 historic sites identified to date are described and are evaluated in terms of their integrity and scientific information yield potential. On the basis of these evaluations, further work is recommended at 21 prehistoric and 5 historic sites. Although the present survey was not sufficient in scope to seek determinations of eligibility for nomination to the National Register of Historic Places, 13 prehistoric and 3 historic sites may be found to be eligible on the basis of the additional work recommended. Seventy-two localities which are potentially significant to the interpretation of the history and prehistory of the area are also described.

Ancillary studies of the geology, soils and vegetation in and near the project area are combined with the cultural resources studies to provide an analysis of the prehistoric settlement patterns. Sites are typically situated on benches along valley margins, and the upper reaches of smaller tributary canyons are preferred over larger mainstem canyons. This reflects the distribution of potable water within the study area. Lithic procurement sites are found to covary with the distribution of Pleistocene or early Holocene gravel deposits. Sites are diffuse in nature and lack large quantities of cultural debris. Unstable landforms and recent erosion have contributed to the destruction or significant disruption of many sites. Temporal indicators are sparse, but occupations extending from Paleoindian through Archaic and Late Prehistoric into Historic times are identified. The most intensive use appears to have been during the late Archaic and the Late Prehistoric periods.

Although Historic-period use of the study area began in the eighteenth century, identified historic sites reflect intensive exploitation of the region beginning in the late nineteenth century and extending into modern times. Sites related to ranching are predominant. However, evidence of mining activities and possibly buffalo hunting is also present.

## ACKNOWLEDGMENTS

As the title suggests, the work which follows is the product of the collective efforts of many individuals, and the acknowledgment of their contributions is a substantial undertaking in itself. Perhaps it is simplest to proceed in chronological order through the various stages of the project.

The original research design was prepared during the winter of 1980-1981 by Susan L. Andrews, under the supervision of Elton R. Prewitt. This proposal served as the core of the research design, and the senior author served largely as the executor of that design during the course of the research. It cannot be overstated that the credit for the logic and the appropriateness of the research design belongs to Ms. Andrews.

Prefield preparations were performed by the senior author with the substantial assistance of Ms. Andrews, Mr. Prewitt, Linda A. Nance, Sandy Price and Kerza Prewitt. Several individuals were instrumental in providing relevant research data: Carolyn Spock of the Texas Archeological Research Laboratory, James E. Bruseth and Bill Westbury of Southern Methodist University, Eileen Johnson of Texas Tech University, and Roberta Speer of West Texas State University. Special thanks are extended to James A. Word of Floydada, probably the reigning expert on the archeology of the region encompassing the project area, whose advice considerably influenced our survey strategy and our priorities in the field.

The archeological survey was performed under the immediate supervision of the senior author. The survey party was divided into two crews respectively headed by Jan A. Guy and William R. Driggers. I had previously worked with both of these individuals, and the experiences of this project reinforced my opinion that both are professionals of the highest caliber. Their ability to maintain a demanding schedule and simultaneously investigate and document large areas in meticulous detail is seldom equaled in archeological research.

Susan Lisk and Barry Brookshire worked as crew members with Jan, and Margaret Howard and Mary Jane McReynolds surveyed on Bill's crew. All worked long, hard hours and maintained high standards of performance and documentation.

Vance Holliday, Ray Kenmotsu and Leroy Werchan served as environmental consultants to the archeological survey. Vance and Ray are prehistoric archeologists with complementary specializations in Quaternary geomorphology and botany, respectively. Leroy is a retired Soil Conservation Service pedologist. All three individuals contributed significantly to the results of the project. In particular, Vance's observations regarding the fluvial geomorphology of the survey area during a joint reconnaissance with the senior author profoundly influenced the conduct of the survey and the character of my interpretations.

Martha Freeman served as our historical consultant, cruising about the remarkably rugged northwest Texas terrain in her small Japanese car to produce an exceptionally interesting and relevant rendition of the local history. Martha has an uncanny ability to ferret out entertaining and informative vignettes from the seemingly most prosaic of contexts, and her presentation of the project area history comprises by far the most engaging portion of this report.

I would like to express my gratitude to Glenn Springer, J. J. Gibson, Bandy Bradley, Tim Jones, Doyle Pittcock, Bernardo Gonzales, Butch Nuding, Trueman Murdoch, Bill Parks, Bill Jones, Louis Burfiend and Ruby Branch for their kindness in granting access to the property under their ownership or control to the senior author, the survey crews and our consultants. None of the property to be affected by the construction of the reservoirs has yet been purchased by the Corps of Engineers, and the performance of this project was entirely at the sufferance of private landowners. We are indebted to the hospitality of these individuals.

The text of Part 1 of this report was written by Susan Andrews and myself. Sue researched and wrote the section on the archeological background. Authorship of the appendices to Part 1 is indicated in the Table of Contents. Part 2 of this report was written by Martha Freeman, as was the second appendix to Part 2. Martha and I collaborated in the preparation of the first appendix to Part 2.

The many excellent illustrations in this report were drafted by Sandy Price and Kerza Prewitt. The text was edited by the senior author, Elton Prewitt and Linda Nance. Linda put in long and undoubtedly frustrating hours transcribing the author's inscrutable handwriting into an IBM Displaywriter.

Much has changed in my life since the completion of this project, and current details crowd out past ones. I have probably failed to adequately acknowledge the contributions of some individuals and have completely neglected others. To all of you, I apologize and can only offer as consolation the following report.

Pete Thurmond  
Leedy, Oklahoma

PART 1  
PREHISTORIC RESOURCES

by

J. Peter Thurmond

and

Susan L. Andrews

## INTRODUCTION

### PURPOSE OF THE STUDY

Natural salt pollution is a serious water quality problem in the upper Brazos River basin of northwestern Texas due to the extensive outcropping of Permian evaporites in the area. Water contamination is particularly severe in the basins of the Salt Fork of the Brazos and North Croton Creek, which together discharge 800 metric tons of chlorides per day into the mainstem Brazos River (Allen et al. 1971:5). Chloride pollution of the river limits the use of its water for municipal, agricultural and industrial purposes downstream. With its rapidly growing population, water is becoming an increasingly critical resource in northwestern Texas.

The U.S. Army Corps of Engineers has been reviewing various alternative approaches to the control of natural salt pollution in the upper Brazos River basin for more than a decade (Allen et al. 1971; U.S. Army Engineer District Staff 1973a, 1973b). A tentatively approved plan calls for the construction of three reservoirs in Kent, King and Stone-wall counties which will inundate 15,873 acres and which will be interconnected by 21.8 miles of pipeline. Three streams are to be impounded: Croton and Salt Croton creeks which are tributaries of the Salt Fork of the Brazos River, and North Croton Creek which enters the mainstem of the Brazos below the confluence of the Salt and Double Mountain forks (Fig. 1).

Dam Site 10 on Croton Creek will inundate 3950 acres and Dam Site 14 on Salt Croton Creek is to cover 1628 acres. The third reservoir, Dam Site 19 on North Croton Creek, is by far the largest and will inundate 10,295 acres. The Corps of Engineers plans to capture the discharge of these three streams, retain it for evaporation, and thereby trap and concentrate the dissolved solids. Dam Site 19 is to serve as the primary storage facility, and water will be pumped to it from the smaller reservoirs through the interconnecting pipeline. For structural reasons, it is necessary to maintain low water levels in the smaller reservoirs, particularly Dam Site 14. If constructed, the project will reduce the chloride load of the Brazos River at Possum Kingdom Reservoir by over half, from 1130 metric tons per day to 530 metric tons per day (Allen et al. 1971:5; Rawson et al. 1968).

Planning of the project has reached the stage at which an assessment of the cultural resources that may be adversely affected by its construction is needed. A preliminary reconnaissance of the project area performed by Southern Methodist University (SMU) in 1973 recorded 30 archeological sites and established the presence of significant prehistoric cultural resources (Skinner 1973). However, that study did not assess the historic resources, nor did it provide an adequate basis for an estimate of the density, distribution and character of prehistoric sites in the project area.



## PART 1: PREHISTORIC RESOURCES

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To meet this planning need, personnel of Prewitt and Associates, Inc. surveyed a stratified random sample of 25 percent of the reservoir basin acreage and pipeline easement mileage during May and June of 1981. An additional 91 prehistoric sites, 17 historic sites and 72 localities were recorded. Corollary expert studies of the project area history, geology, soils and vegetation were conducted. Current work was limited to surface survey; no subsurface testing was included as part of the program. The following is a report of the 1981 Prewitt and Associates, Inc. investigations, but incorporates the data collected by the 1973 SMU reconnaissance.

### MODERN CHARACTER OF THE PROJECT AREA

The project area is within the Rolling Plains of northwestern Texas some 30 to 70 kilometers east of the Llano Estacado in northeastern Kent, southern King and northern Stonewall counties (Fig. 1). It is an area of often rugged terrain known as the Croton Breaks which is dissected by the numerous steep-walled canyons of Brazos River tributaries. The region is underlain by Permian red-bed clastics which are interbedded with halitic and selenitic evaporites. Salt concentrations along many of the streams are so high that salt flats parallel the braided watercourses. The dominant vegetation was once grassland, but overgrazing has fostered explosions in the populations of mesquite, juniper and other woody shrubs.

Roads are few and frequently unimproved, and towns are small and widely scattered. Ranching dominates the local economy; individual landholdings tend to be quite large and encompass many contiguous square-mile sections. Farming in the immediate project area is quite limited and is typically conducted only as a sideline within the major ranches. However, petroleum exploration and production have provided a significant boost to the economy of the eastern third of the area in recent years.

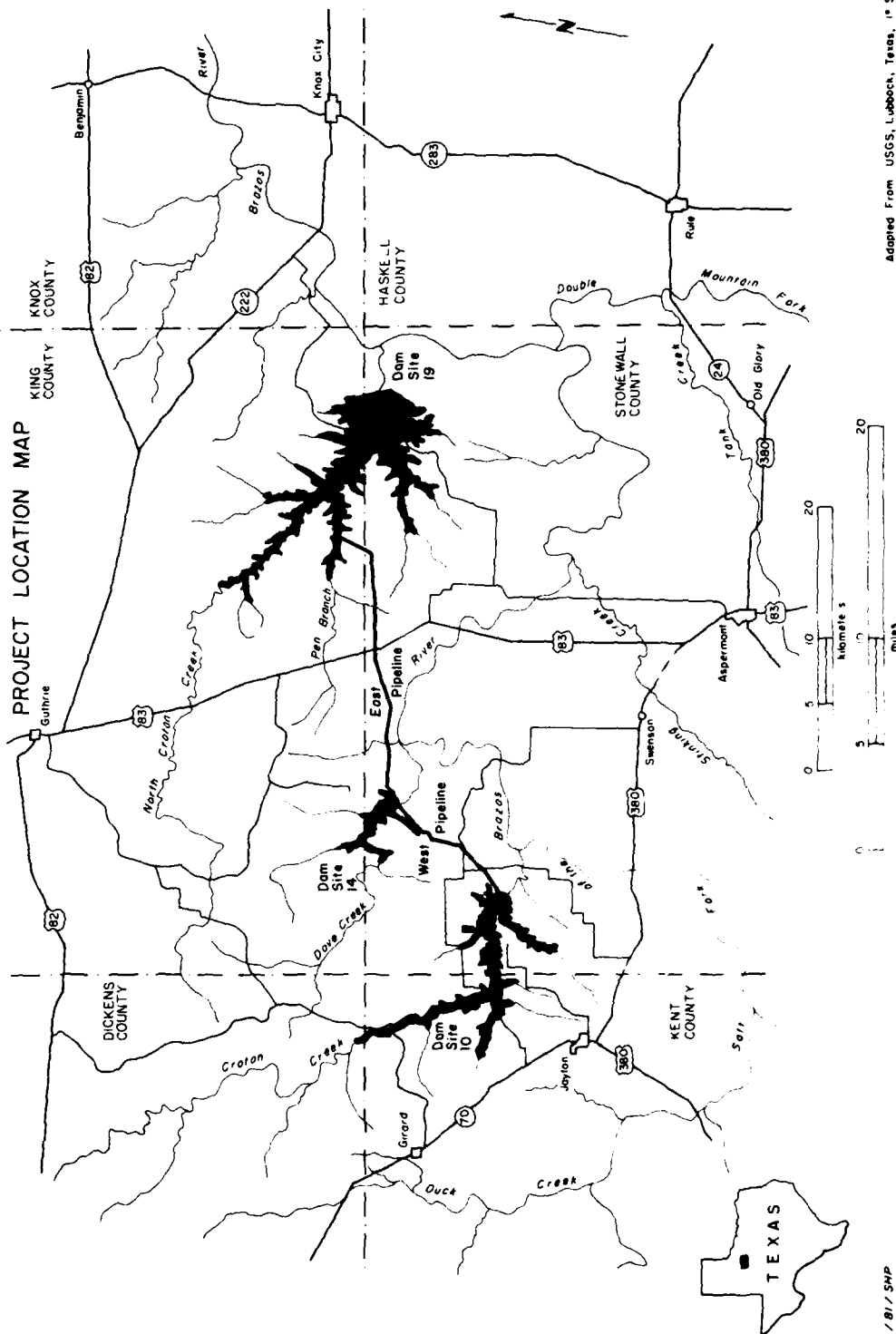
The population reflects the limited and land-intensive nature of the local economy. The 1970 census recorded a population of 4300 for the Kent-King-Stonewall county area; over half the populace resides in small towns (Kitchen et al. 1971:Table E-1; Pass 1977:192-194). Probably fewer than 200 people currently live within the immediate project area.

### REPORT ORGANIZATION

A complete outline of the report is provided in the Table of Contents. As can be seen therein, the report is divided into separate treatments of the prehistoric and historic cultural resources of the project area, designated Parts 1 and 2. Within each part, the text summarizes: (1) any information pertinent to an assessment and interpretation of the cultural resources; (2) the relevant research design and methods; (3) the cultural resources recorded to date within the

# **BRAZOS NATURAL SALT POLLUTION PROJECT** **KENT, KING & STONEWALL COUNTIES, TEXAS**

## **PROJECT LOCATION MAP**



**Figure 1**

Adapted From USGS, Lubbock, Texas, 1<sup>st</sup> Sheet, 1965

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## PART 1: PREHISTORIC RESOURCES

project area; (4) our assessment and interpretation of those resources; and (5) our recommendations for their management. Detailed descriptions of the data are presented as appendices.

### ENVIRONMENTAL SETTING

#### INTRODUCTION

This section contains a brief review of the climate, hydrology, outcrop lithology, physiography, soils, flora and fauna of the Brazos Natural Salt Pollution Control Project area with two primary objectives in mind: (1) to provide a general, introductory characterization of the natural environment for the benefit of the reader not familiar with the area, and (2) to introduce and summarize environmental data relevant to an interpretation of the distribution and integrity of the archeological sites recorded during the present study. More intensive geological, soils and floral investigations were conducted in concert with the archeological survey; the results of those investigations are reported in detail in Appendices V through VII.

#### CLIMATE

The climate of the Brazos Natural Salt Pollution Control Project area is relatively mild with hot summers and cool winters. The mean monthly temperatures range from 6° C in January to 29° C in July (Pass 1977:130-133). Extreme temperatures recorded at Spur, located on the northwestern margin of the project area, are -27° C in February of 1933 and 46° C in June of 1924 (U.S. Army Engineer District Staff 1973b:III-4). The first freezing temperature generally occurs in early November, and the last in mid-March (Arbingast et al. 1973:19). Periods of freezing temperatures during the winter generally last for only a few days after the passage of each cold front.

The prevailing wind direction is southwesterly during the winter months and southerly in the summer (Arbingast et al. 1973:20). Passage of winter cold fronts causes rapid shifts of wind direction to northerly or northwesterly, but the winds soon return to the southwest. Maximum wind speeds occur in association with winter cold fronts and summer thunderstorms. The mean annual wind speed is 22 kilometers per hour, but a maximum of 113 kilometers per hour has been recorded (U.S. Army Engineer District Staff 1973b:III-4).

Mean annual precipitation at Aspermont is 55 centimeters; extremes of 18 centimeters and 110 centimeters were recorded in 1956 and 1941, respectively (U.S. Army Engineer District Staff 1973b:III-4). Rainfall is fairly evenly distributed through the year although there is a distinct maximum associated with the period from late spring to early fall; 68 percent of the mean annual precipitation occurs from May to October (U.S. Army Engineer District Staff 1973b:III-7). Summer rainfall is typically produced by relatively violent convective thunderstorms, and

such rainfall tends to occur at a rate and intensity conducive to rapid runoff. Winter rains are generally much slower and gentler, and produce little direct runoff. A minor portion of the winter precipitation occurs as snow; the mean annual snowfall is 5 centimeters (U.S. Army Engineer District Staff 1973b:III-7).

#### HYDROLOGY

The three primary drainages in the immediate project area are Croton and Salt Croton creeks, both tributaries of the Salt Fork of the Brazos River, and North Croton Creek which enters the Brazos River below the confluence of the Salt and Double Mountain forks (Fig. 1).

Croton Creek is the mainstem of the Dam Site 10 reservoir basin. The drainage area at its mouth is 803 square kilometers (U.S. Army Engineer District Staff 1973a:47). Its primary tributaries in the immediate reservoir basin vicinity are Cottonwood, Hot Springs, Panther, Salt and Short Croton creeks. Although the mean discharge of Croton Creek is 452 liters per second (Table 1), its base flow ranges from 0 to 10 liters per second. The maximum dissolved solids concentration recorded along the stream is 20,000 parts per million (U.S. Army Engineer District Staff 1973a:47).

Salt Croton Creek forms the mainstem of the Dam Site 14 basin. The stream and its tributaries drain a total area of 167 square kilometers (U.S. Army Engineer District Staff 1973a:48); this is far less than that of Croton or North Croton creeks. Primary tributaries in the immediate reservoir basin area are Dove, Haystack, Salt Flat and Southerland creeks and Bitter Gulch. The mean discharge of Salt Croton Creek is 203 liters per second (Table 1), but its base flow is typically less than 1 liter per second (U.S. Army Engineer District Staff 1973a:48). The effluent of the stream during periods of low flow is a concentrated brine which ranges up to 250,000 parts per million of dissolved solids (mostly chlorides); this is seven times the concentration of seawater. Salt Croton Creek contributes 65 percent of the total chloride load of the Salt Fork of the Brazos River (U.S. Army Engineer District Staff 1973a:48).

North Croton Creek is the mainstem of the Dam Site 19 basin. Its total drainage area is 650 square kilometers (U.S. Army Engineer District Staff 1973a:50). The principle tributaries of North Croton Creek in the immediate vicinity of the reservoir basin are Pen Branch and Bradley, Smelter and Wedington creeks. Mean discharge of the mainstem is 706 liters per second (Table 1), but its base flow is apparently less than 1 liter per second. Dissolved solids concentrations as high as 94,000 parts per million have been recorded during periods of low flow (U.S. Army Engineer District Staff 1973a:50).

Water is one of the most critical resources within the project area. However, the primary limiting factor for habitation is not so much water availability as it is water quality. The figures on dissolved solids concentrations (primarily chlorides) cited above and in

## PART 1: PREHISTORIC RESOURCES

Table 1 speak for themselves. The basic cause of the shortage of potable water lies in the distribution and character of groundwater and the pattern of its discharge.

Two units of groundwater are identified in the project area (U.S. Army Engineer District Staff 1973b:20-21). The lower of these units, which is responsible for the base flow of most streams, is a body of sodium chloride brine which flows under artesian pressure. Average chloride concentration within this aquifer is 250,000 parts per million (U.S. Army Engineer District Staff 1973b:20-21). Effluent from the unit is the primary source of salt pollution in the area and is responsible for the formation of the broad salt flats along Croton and Salt Croton creeks and their tributaries. Discharge of the unit is perennial and tends to occur at the lower elevations within the stream valleys (U.S. Army Engineer District Staff 1973b:20-21).

The upper of the two groundwater units is shallow and is intermittent in discharge because it is dependent on local recharge (U.S. Army Engineer District Staff 1973b:20-21). Precipitation that falls on the broad upland interfluvial divides of the area infiltrates and flows laterally through the soil and near-surface bedrock units to discharge along the walls of the stream valleys. The effluent of this unit is thus delayed runoff by definition. The size and location of upper groundwater unit aquifers is strongly controlled by the local physiography and the character of the local soils and near-surface bedrock since these factors control the rate of infiltration (e.g., gentle slopes and permeable soils and bedrock units greatly enhance the infiltration of precipitation).

In comparison to that of the lower unit, the water of the upper unit is relatively fresh and averages only 2000 to 5000 parts per million total dissolved solids (U.S. Army Engineer District Staff 1973a:20-21). Further, the principal dissolved mineral constituent is calcium sulphate rather than sodium chloride (U.S. Army Engineer District Staff 1973a:20-21). This is an important distinction. Sodium chloride brine will dehydrate human consumers and is considered toxic at the concentrations which occur frequently within the project area. By contrast, humans can apparently tolerate low to moderate concentrations of calcium sulphate although this requires an adaptation of the gastrointestinal tract. Local residents refer to such water as "gyp" water; often they use it to supply the needs of their livestock, and, in a pinch, will drink it themselves.

In summary, two sources of potable water are identified on the basis of the presently available data. During periods of high direct runoff immediately after the occurrence of substantial rainfall, potable water is available for a short time in the channels of the mainstem creeks and their major tributaries. The large contribution of relatively fresh direct runoff dilutes the brine effluent of the lower groundwater unit. This source of water is intermittent, especially along the lower reaches of Salt Croton Creek.

TABLE 1  
SALT YIELDS OF CROTON, SALT CROTON AND NORTH CROTON CREEKS<sup>1</sup>

| Stream & Location                    | Drainage<br>Basin Area<br>(km <sup>2</sup> ) | Mean<br>Discharge <sup>2</sup><br>(l/s) | Loads (MT/D) <sup>3</sup> |          |          |
|--------------------------------------|--|---|---------------------------|----------|----------|
|                                      |  |   | Dissolved<br>Solids       | Chloride | Sulphate |
| Croton Creek<br>near Jayton          | 803  | 452                                     | 218                       | 68       | 73       |
| Salt Croton Creek<br>near Aspermont  | 167  | 203                                     | 834                       | 481      | 32       |
| North Croton Creek<br>near Knox City | 650  | 706                                     | 172                       | 45       | 64       |

<sup>1</sup>Adapted from Rawson et al. 1968.

<sup>2</sup>l/s = liters per second

<sup>3</sup>MT/D = metric tons per day

## PART 1: PREHISTORIC RESOURCES

The delayed runoff of the upper groundwater unit is more reliable due to the much greater lag time from precipitation to stream entry. Subsequent to each major rainfall event, this source of water may be expected to be available for a fairly prolonged period of time after the subsidence of direct runoff and the return of the streams to base flow. It is worthy of note that this second source, by virtue of the nature of its origins, varies considerably in local availability and reliability. One may expect to find springs of this unit discharging in the middle to upper elevations of relatively minor tributary valleys which dissect broad, gently rolling, sandy upland areas of low stream density. Upon entering a stream channel, upper unit effluent tends to be rapidly contaminated by lower unit brine. The fresh water must therefore be exploited at or near its source.

Finally, it must be realized that the present discharge of the upper groundwater unit cannot be considered representative of prehistoric levels. Modern land use, primarily overgrazing, has led to the severe denudation of much of the project area; this has in turn caused serious loss of topsoil through erosion. Both of these factors must surely have caused increased direct runoff and a proportionate decrease in the recharge of the upper unit. Further, artificial discharge now accounts for a major percentage of the unit effluent. Local ranchers rely heavily on windmill-operated wells drawing from the upper groundwater unit to supply the water needs of their livestock. Undoubtedly, the intermittency of upper groundwater discharge has been intensified by these modern practices.

### OUTCROP LITHOLOGY

Four major Permian red-bed units crop out within the project area in roughly parallel north/south-trending exposures. The units decrease in age from east to west and are, in that order, the Choza Formation of the Clear Fork Group, the San Angelo and Blaine formations of the El Reno Group, and the Whitehorse Group in which individual formations are not locally distinguished (Barnes 1967). The four units dip gently to the northwest and have suffered little post-depositional structural deformation. Although the units are generally similar to one another, there are significant differences within and between them in mineralogy, texture and degree of cementation. These are the locally dominant factors which control the character and distribution of physiographic landforms and soils.

The Choza Formation crops out at lower elevations along the lower reaches of North Croton Creek in the eastern Dam Site 19 basin and is composed of alternating beds of sandy, red and bluish green shales and gray, moderately indurated, fine-grained sandstone. The shales are volumetrically predominant, but the sandstone tends to be somewhat more resistant to erosion.

At the intermediate elevations along the eastern end of the Dam Site 19 basin, the San Angelo Formation crops out. The unit is primarily composed of red and gray, poorly consolidated, fine-grained

sandstone, but it also exhibits thin beds of shale and conglomerate that contain dolomite and limestone gravels. The conglomerate beds are by far the most resistant to erosion; one such bed forms the canyon rim along the lower reaches of Bradley Creek.

In terms of total area of exposure, the Blaine Formation and the Whitehorse Group dominate the project area. The Blaine outcrop begins at the upper elevations along the east end of the Dam Site 19 basin and extends westward to the lower elevations of the Dam Site 14 basin. The lower portion of the unit, which forms the bedrock of the western Dam Site 19 basin, is a suite of complex interbedded shales, moderately indurated sandstones, gypsum and dolomite. Individual beds within this area tend to be thin. Proceeding westward, massive beds of gypsum and red or gray shales become dominant; these reach their maximum expression in the vicinity of the Dam Site 14 basin.

The Whitehorse Group first appears at the upper elevations surrounding the Dam Site 14 basin, and its outcrop extends westward to incorporate the entire Dam Site 10 basin. The unit is dominated by massive beds of a red, fine-grained, poorly consolidated silty sandstone, but occasional interbeds of red shale, gypsum and dolomite also occur. The gypsum beds in particular may be locally massive and are more resistant to erosion.

The outcrop areas of the Permian units comprise the vast majority of the project area, but narrow belts of Quaternary alluvial deposits parallel the major streams. Broad sheets of Quaternary wind-blown sands occur south of the Salt Fork of the Brazos River but do not occur within the immediate project area.

Tentative alluvial terrace sequences for the mainstems of the three reservoir basins have been established during this project (Appendix V). Along Croton Creek, three fill terraces can be identified above the modern floodplain at elevations of 3 meters, 6 to 9 meters, and 12 to 18 meters above the modern channel. A high strath terrace is apparent at an elevation of 21 to 24 meters. Deposits up to the level of the 6-to-9-meter terrace are of quite recent origin. Gravels derived from the upper two terraces were exploited as lithic resources by aboriginal groups.

Three alluvial terraces were observed along Salt Croton Creek. Fill terraces occur at elevations of 1 to 3 meters and 6 to 9 meters above the modern floodplain. The lower of the two terraces appears to date to modern times; skeletal remains of modern domesticated animal species were observed eroding from the base of the terrace. The 6-to-9-meter terrace exhibits weak soil development and probably originated within the last few centuries. Finally, a high strath terrace at elevations greater than 12 meters appears to be of at least late Pleistocene age, and its gravels were also exploited aboriginally.

The valley fill of North Croton Creek has probably originated entirely within the past 1000 years. The stream flows in a deep, narrow channel through a 6-to-9-meter fill terrace which is clearly still



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actively aggrading and exhibits no soil development. At elevations of 12 to 15 meters, remnants of a strath terrace of at least late Pleistocene age are visible on the north rim of the valley. These remnants were exploited aboriginally for their gravels.

To summarize, a narrow belt of essentially modern alluvium parallels each of the mainstems and forms the valley floor of each. Remnants of somewhat older Holocene fill terraces occur intermittently at intermediate elevations in the valley profile, and severely deflated Pleistocene strath terrace remnants occur along the valley rims. Typically, Permian bedrock outcrops occupy the major part of the valley walls and all of the upland areas. The development of an alluvial terrace system is minimal along North Croton Creek and reaches its maximum expression in the Croton Creek valley.

### PHYSIOGRAPHY

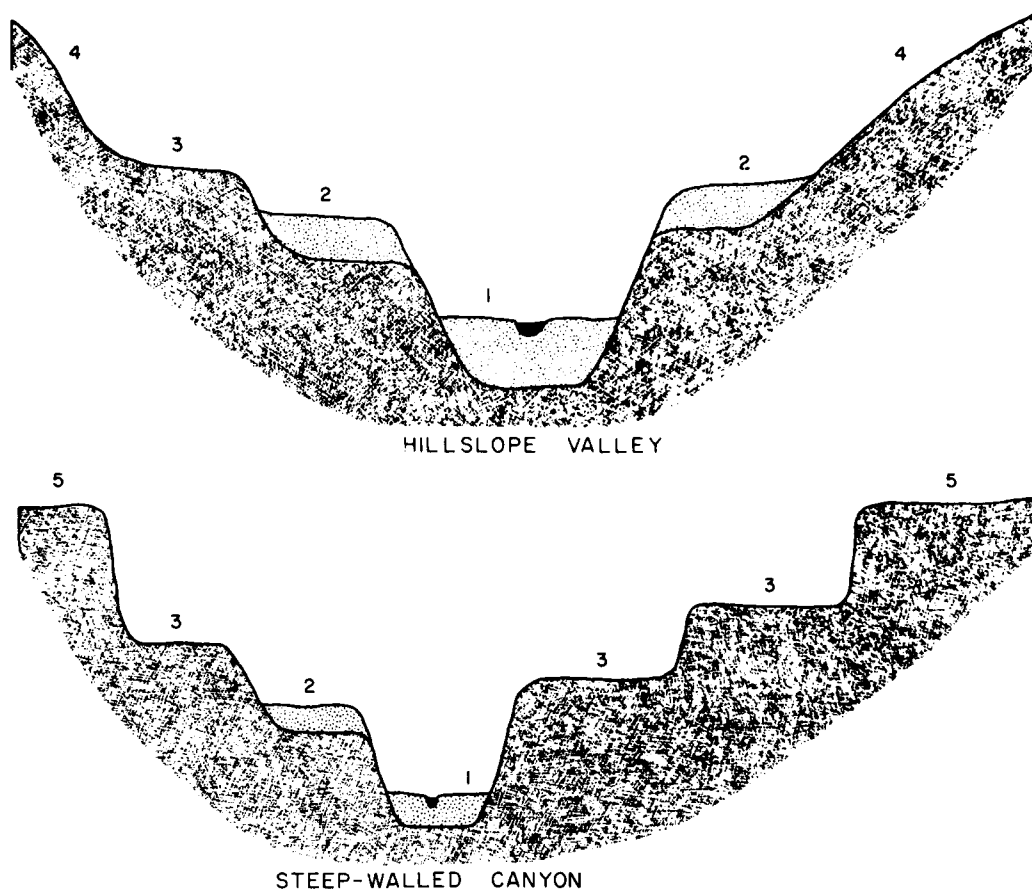
The physiography of the project area is primarily a product of fluvial and erosional processes and has been profoundly influenced by the composition of the outcropping bedrock. On an areawide level of generalization, the topography is characterized by broad, gently rolling upland areas which are broken by occasional escarpments and badlands along the outcrop lines of particularly massive and resistant beds of gypsum or dolomite, and dissected stream valleys which are often relatively deep and narrow.

The interbedding of weakly consolidated and indurated materials in the geologic units outcropping within the project area has produced classic stairstep topography along most of the stream valleys. In areas where these interbed contrasts in resistance to erosion are most pronounced, the streams have incised deep, narrow, steep-walled canyons in which the valley walls are occupied entirely by a succession of relatively level benches that are separated by very steep scarps. Typically, a bed of dolomite, gypsum, conglomerate or indurated sandstone occurs just beneath the surface of each bench and is responsible for its formation. At the lower elevations, these benches may be overlain by alluvial terrace deposits, but benches higher in the valley profile are commonly capped only by a shallow mantle of weathered interbed material that usually consists of a poorly consolidated sandstone or shale. Topography of the steep-walled canyon variety is best expressed in the outcrop area of the lower Blaine Formation along the upper reaches of the Dam Site 19 area. Where interbed contrasts in resistance to erosion are less pronounced, or where the outcropping bedrock is dominated by poorly consolidated clastics and the frequency of occurrence of resistant dolomite or gypsum beds is low, stream valleys tend to be relatively wide, the formation of discrete benches is substantially reduced, and the valley profile is composed of gentler slopes. These two extremes of valley morphology are contrasted in Figure 2. Representative examples of the topography which prevails in the three reservoir basins are illustrated in Figures 3 through 5. The topographic effects of the individual Permian bedrock units are discussed in greater detail in Appendix V.

Figure 2

# BRAZOS NATURAL SALT POLLUTION PROJECT



## GENERALIZED PHYSIOGRAPHIC PROFILES



### LEGEND

- 1 Modern Channel & Floodplain
- 2 Alluvial Terrace
- 3 Bedrock Bench
- 4 Valley Margin Slope
- 5 Canyon Rim

### LANDFORMS

-  Permian Bedrock
-  Quaternary Alluvium

PART 1: PREHISTORIC RESOURCES

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Figure 3. General environmental views in the Dam Site 10 Basin

a. Looking south across the large salt flat at the head of Short Croton Creek, from the northwestern corner of Survey Unit B-8. Note the low terrace remnant in the left foreground and the bedrock benches underlain by gypsum beds which skirt the margins of the salt flat, giving way to gentle slopes rising into the uplands. The bedrock in this area is dominated by poorly consolidated sandstone of the Permian Whitehorse Group. Sites 41KT9 and 41KT10 occupy bedrock benches in the background, on the far side of the salt flat.

b. View east-southeast, downstream along Croton Creek, from the northwestern corner of Survey Unit A-33. An outcrop of the Eskota Gypsum of the Whitehorse Group has formed a well-defined canyon rim, with steep scarps down to the valley floor. Lag gravels deflated from the 12 meter Croton Creek terrace, recorded as locality L41KT9, occupy the canyon rim at left. Virtually all of the alluvium in view along the canyon floor is of late Holocene to very recent origin.

Figure 3



*a*



*b*

## PART 1: PREHISTORIC RESOURCES

Figure 4. General environmental views in the Dam Site 14 Basin.

a. View west up Salt Croton Creek from the south end of Survey Unit A-67. Note the broad, flat channel and concomitant salt flat formation. The stream was approaching base flow at the time of this photograph, and its effluent was a concentrated brine. A small remnant of the recent 1-to-3-meter terrace is visible at right, and massive beds of gypsum of the Whitehorse Group can be seen to outcrop at left of center and in the background.

b. Facing west across a short tributary of Southerland Creek, at the northern end of locality L41KG14. Notice how the gently rolling uplands in the background dramatically give way to a relatively steep-walled canyon, and the series of shelving bedrock benches which lie between the canyon rim and the stream channel. The bedrock is complexly interbedded gypsum and shale of the Permian Blaine Formation. This stream is spring-fed by the upper groundwater unit, and its water is relatively fresh.

Figure 4



*a*



*b*

## PART 1: PREHISTORIC RESOURCES

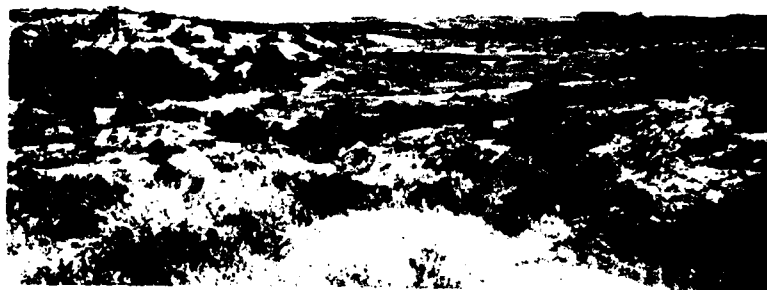
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Figure 5. General environmental views in the Dam Site 19 Basin.

a. A view southeast, facing downstream along North Croton Creek in Survey Unit B-85 in the western part of the basin. Dolomite and gypsum of the Permian Blaine Formation dominate the lithology in this area, producing considerable relief. Note the extensive areas of bedrock exposure. The valley fill along the stream is of late Holocene to modern origin, and the entire valley floor is actively aggrading. Lag gravels deriving from the 12-to-15-meter North Croton Creek strath terrace are scattered down the slope at left of center.

b. Facing downstream along Bradley Creek in a view to the south-southwest, at the eastern end of the basin. The bedrock in this area is dominated by poorly consolidated sandstones and shales of the Permian San Angelo and Choza Formations, resulting in much less pronounced physiographic relief. Site 41KG38 occupies the bedrock bench at left.

Figure 5



*a*



*b*



## PART 1: PREHISTORIC RESOURCES

A simplified classification of area landforms is employed for recording and reporting site-specific physiographic association as illustrated in Figure 2. Alluvial terraces and bedrock benches are differentiated on the basis of the origins of the material which lies on the surface of the landform; terraces are capped by Quaternary alluvium, while the surface of a bench is formed by weathered Permian bedrock. In steep-walled canyons, the uppermost bedrock bench is termed the canyon rim. Relatively broad, gentle to moderate slopes within stream valleys, underlain by Permian bedrock, are termed valley margin slopes. Such slopes which occur above the margin of a hillslope valley or rim of a steep-walled canyon are referred to as upland slopes. This suite of terms quite comfortably deals with the range of variation in site locations. As discussed in greater detail in the concluding sections of this report, most of the aboriginal sites occur along the streams on bedrock benches or canyon rims.

### SOILS

On a descriptive level, the soils of the project area form a complex patchwork of variability and reflect analogous and genetically related variations in the texture, mineralogy and degree of cementation of the parent materials. However, from a genetic point of view, the distribution of soil units is fairly simple and can be profitably discussed in terms of landform association on the classificatory level of the subgroup within the Soil Conservation Service Seventh Approximation (Soil Survey Staff 1975). This approach most efficiently permits one to address the relevant issues of landform stability and the integrity of the context of cultural deposits.

The relative stability of the gently rolling upland areas is reflected in their association with deep soils which exhibit substantial horization. Typic Paleustolls, Typic Paleustalfs and Typic Haplustalfs with well-developed argillic and calcic horizons occur on gently sloping to nearly level surfaces. On more moderate slopes, where soil formation is somewhat retarded by low-level sheet erosion, Typic Ustochrepts with cambic B and calcic horizons are found.

The soils within the stream valleys and upland badland areas present an entirely different picture. Moderate to strongly sloping surfaces conducive to rapid erosion are common, and soil formation is severely retarded. The more moderate slopes and the rear portions of bedrock benches are occupied by Typic Ustochrepts, but most of the Permian bedrock landforms are associated with Lithic Ustorthents and Lithic Torriorthents. The former occur on finer-textured parent materials, and the latter on sandy bedrock. Many of the steeper scarps are completely devoid of soil. Finally, the mid to early Holocene alluvial fill terraces exhibit Typic Ustochrepts, while Typic Ustifluvents occur in association with the more recent deposits which are still actively aggrading.

Where Alfisols and Mollisols occur, it can be assumed that the associated surface has been relatively stable since late Pleistocene

times. The occurrence of an Inceptisol on Permian parent material suggests moderate instability, and one may expect cultural remains on an associated landform to be only shallowly buried at best through colluvial or eolian processes. The inference of instability is even more pronounced where Orthents occur, and cultural deposits may be expected to be deflated in such contexts. On relatively level fill terrace deposits, the weak soils development of an Inceptisol suggests surface stability since mid to early Holocene times. One may expect to find only early Archaic or Paleoindian cultural deposits buried to any depth in such landforms, and any surface or near-surface deposits will probably be of middle Archaic age or later. It is highly unlikely that aboriginal cultural remains will be found at the surface of the recent landforms associated with Ustifluvents. The surfaces of these landforms have been actively aggrading through alluvial deposition into essentially modern times. However, cultural remains of late Archaic or Late Prehistoric age could well be found deeply buried in these landforms.

#### VEGETATION

The existing flora of the area exhibits severe disturbance by modern land use practices (primarily overgrazing), and concomitant invasion and dominance by opportunistic and invader species. Certainly, any microenvironmental differentiation which may have existed in late prehistoric times has been obliterated, and the composition and density of the local flora has been altered. Generally speaking, overgrazing has selected against the more palatable grasses, and in combination with the suppression of range fires, has precipitated an explosion in the populations of various woody shrubs and forbs.

Three modern vegetation assemblages are identified in this highly disturbed environment. The upland slopes, valley margin slopes and bedrock benches are associated with an assemblage dominated by redberry juniper (Juniperus pinchoti) and mesquite (Prosopis glandulosa) with an understory of woody shrubs such as wolfberry (Lycium sp.) and catclaw (Acacia greggi) and low shrubby species like featherplume (Dalea formosa). Ground cover within this assemblage is minimal due to the release by the junipers of inhibitory organic compounds which retard herbaceous growth.

The larger alluvial terraces and modern floodplains are occupied by an assemblage dominated by mesquite with a dense understory of short buffalograss (Buchloe dactyloides), silverleaf nightshade (Solanum eleagnifolium), buffalobur (S. rostratum), pepperweed (Lepidium sp.), lemon beebalm (Monarda citriodora), rescuegrass (Bromus unioloides) and tasajillo (Opuntia leptocaulis).

Finally, the banks and beds of the major streams are lined with dense thickets of saltcedar (Tamarix gallica) with little or no associated understory.

It should be noted that there is considerable local variation within these assemblages. In particular, many of the broader and more

## PART 1: PREHISTORIC RESOURCES

gently sloping upland, terrace and floodplain areas are now under cultivation or are in open pasture maintained by bulldozer grubbing, chaining and aerial spraying of broadleaf defoliants (primarily 2-4-D).

The regional botanical literature is reviewed in Appendix VII in an attempt to reconstruct the vegetation of the region incorporating the project area. Generally speaking, it seems likely that the more gently sloping upland, terrace and floodplain areas were occupied in late prehistoric times by a relatively open prairie of short to mid grasses with scattered mesquite and juniper. The steep slopes along the valley margins have probably always been rather marginal environments dominated by juniper and other woody species.

### FAUNA

The fauna of the project area, like the vegetation, has suffered rather severe disturbance by Anglo exploitation. A list of the major faunal species presently occurring or known to have occurred in the project area in historic times is provided in Table 2. This list is by no means inclusive; in particular, the broad range of songbirds indigenous to the area is not represented. The latter information has been previously published (U.S. Army Engineer District Staff 1973b:Appendix A) and is not considered relevant to the present study.

A number of the species listed in Table 2 have been virtually extirpated from the area. Perhaps the most dramatic extermination was that of the bison in the 1870s. Black bear were never particularly numerous and apparently disappeared by 1900. Other species dwindled and disappeared more slowly. Among those virtually eliminated from the area are the pronghorn antelope, collared peccary (javelina), bobcat, cougar, red fox, black-footed ferret, ringtail, porcupine, black-tailed prairie dog, greater and lesser prairie chicken and Southern bald eagle (Bolen and George 1971; Davis 1974). The predators and prairie dogs were removed to protect domestic livestock, and the other species have been subjected to intense hunting pressure. Wild turkey and deer populations appear to have suffered substantial reduction from such pressure.

Particularly interesting is the apparent reduction in the number of aquatic species occurring in the project area. Of the fish species listed in Table 2, only the pupfish and killifish have recently been observed in any numbers in project area streams (Bolen and George 1971). Both of these species are known to be salt tolerant, and the reduction in numbers of the freshwater species may reflect increased salinity in the streams due to artificial discharge of the upper groundwater unit for use by livestock.

It seems likely that, due to the poor quality of water obtained in the project area, aquatic animal resources were never very important. However, given the limited availability of potable water, its points of occurrence may well have served as ideal hunting spots during prehistoric times; game could be expected to concentrate in such areas. If this

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TABLE 2

MAJOR FAUNA OF THE BRAZOS NATURAL SALT POLLUTION CONTROL PROJECT AREA<sup>1</sup>

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FISHES

|                      |                                   |
|----------------------|-----------------------------------|
| Red River pupfish    | <u>Cyprindon rubrofluviatilis</u> |
| Rio Grande killifish | <u>Fundulus zebrinus</u>          |
| Alligator gar        | <u>Lepisosteus spatula</u>        |
| Channel catfish      | <u>Ictalurus panstautus</u>       |
| Shiners              | <u>Notropis sp.</u>               |
| Small-mouth buffalo  | <u>Ictiobus bubalus</u>           |
| Drum                 | <u>Aplodinotus grunniens</u>      |
| Large-mouth bass     | <u>Micropterus salmoides</u>      |
| Red ear sunfish      | <u>Lepomis microlophus</u>        |
| Bream                | <u>L. gibbosus</u>                |
| White crappie        | <u>Pomoxis annularis</u>          |

AMPHIBIANS

|                        |                             |
|------------------------|-----------------------------|
| Spotted salamander     | <u>Ambystoma maculatum</u>  |
| Eastern spadefoot toad | <u>Scaphiopus holbrooki</u> |
| Southern toad          | <u>Bufo terrestris</u>      |
| Bullfrog               | <u>Rana catesbeiana</u>     |
| Leopard frog           | <u>R. pipiens</u>           |

REPTILES

|                     |                              |
|---------------------|------------------------------|
| Snapping turtle     | <u>Chelydra serpentina</u>   |
| Mud turtle          | <u>Kinosternon subrubrum</u> |
| Western box turtle  | <u>Terrapene ornata</u>      |
| Cooter turtle       | <u>Pseudemys floridana</u>   |
| Softshell turtle    | <u>Amyda ferox</u>           |
| Texas horned lizard | <u>Phrynosoma cornutum</u>   |
| Spiny lizard        | <u>Sceloporus spinosus</u>   |
| Collared lizard     | <u>Crotaphytus collaris</u>  |

<sup>1</sup>Data abstracted from Bolen and George 1971; Davis 1974; Olsen 1968; Peterson 1963; U.S. Army Engineer District Staff 1973b.

TABLE 2, continued

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|                                 |                               |
|---------------------------------|-------------------------------|
| Greater five-lined skink        | <u>Eumeces laticeps</u>       |
| Western whiptail                | <u>Cnemidophorus tigris</u>   |
| Water snake                     | <u>Natrix sipedon</u>         |
| Corn snake                      | <u>Elaphe guttata</u>         |
| Gopher snake                    | <u>Pituophis catenifer</u>    |
| Garter snake                    | <u>Thamnophis sirtalis</u>    |
| King snake                      | <u>Lampropeltis getulus</u>   |
| Black racer                     | <u>Coluber constrictor</u>    |
| Western diamondback rattlesnake | <u>Crotalus atrox</u>         |
| Cottonmouth water moccasin      | <u>Ancistrodon piscivorus</u> |

BIRDS

|                         |                                 |
|-------------------------|---------------------------------|
| American widgeon        | <u>Mareca penelope</u>          |
| Turkey buzzard          | <u>Cathartes aura</u>           |
| Southern bald eagle     | <u>Haliaeetus leucocephalus</u> |
| Sparrow hawk            | <u>Falco sparverius</u>         |
| Greater prairie chicken | <u>Tympanuchus cupido</u>       |
| Lesser prairie chicken  | <u>T. pallidicinctus</u>        |
| Bobwhite quail          | <u>Colinus virginianus</u>      |
| Scaled (blue) quail     | <u>Callipepla squamata</u>      |
| Turkey                  | <u>Meleagris gallopavo</u>      |
| Mourning dove           | <u>Zenaidura macroura</u>       |
| Roadrunner              | <u>Geococcyx californianus</u>  |
| Burrowing owl           | <u>Speotyto cunicularia</u>     |
| Blue jay                | <u>Cyanocitta cristata</u>      |
| Common crow             | <u>Corvus brachyrhynchos</u>    |

MAMMALS

|                    |                              |
|--------------------|------------------------------|
| Opossum            | <u>Didelphis virginiana</u>  |
| Eastern mole       | <u>Scalopus aquaticus</u>    |
| Least shrew        | <u>Cryptotis parva</u>       |
| Desert shrew       | <u>Notiosorex crawfordi</u>  |
| Cave bat           | <u>Myotis velifer</u>        |
| Western canyon bat | <u>Pipistrellus hesperus</u> |

TABLE 2, continued

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|                                |                                      |
|--------------------------------|--------------------------------------|
| Big brown bat                  | <u>Eptesicus fuscus</u>              |
| Hoary bat                      | <u>Lasiurus cinereus</u>             |
| Guamo bat                      | <u>Tadarida mexicana</u>             |
| California jackrabbit          | <u>Lepus californicus</u>            |
| Eastern cottontail             | <u>Sylvilagus floridanus</u>         |
| Audubon cottontail             | <u>S. auduboni</u>                   |
| Thirteen-lined ground squirrel | <u>Spermophilus tridecemlineatus</u> |
| Spotted ground squirrel        | <u>S. spilosoma</u>                  |
| Black-tailed prairie dog       | <u>Cynomys ludovicianus</u>          |
| Plains pocket gopher           | <u>Geomys bursarius</u>              |
| Hispid pocket mouse            | <u>Perognathus hispidus</u>          |
| Ord kangaroo rat               | <u>Dipodomys ordii</u>               |
| Deer mouse                     | <u>Peromyscus maniculatus</u>        |
| Texas mouse                    | <u>P. attwateri</u>                  |
| Hispid cotton rat              | <u>Sigmodon hispidus</u>             |
| Gray wood rat                  | <u>Neotoma micropus</u>              |
| Porcupine                      | <u>Erethizon dorsatum</u>            |
| Black bear                     | <u>Ursus americanus</u>              |
| Raccoon                        | <u>Procyon lotor</u>                 |
| Ringtail                       | <u>Bassaricus astutus</u>            |
| Black-footed ferret            | <u>Mustela nigripes</u>              |
| Striped skunk                  | <u>Mephitis mephitis</u>             |
| Badger                         | <u>Taxidea taxus</u>                 |
| Red fox                        | <u>Vulpes fulva</u>                  |
| Coyote                         | <u>Canis latrans</u>                 |
| Cougar                         | <u>Felis concolor</u>                |
| Bobcat                         | <u>Lynx rufus</u>                    |
| Collared peccary               | <u>Pecari tajacu</u>                 |
| Pronghorn antelope             | <u>Antilocapra americana</u>         |
| Mule deer                      | <u>Odocoileus hemionus</u>           |
| White-tailed deer              | <u>O. virginiana</u>                 |
| Buffalo                        | <u>Bison bison</u>                   |

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## PART 1: PREHISTORIC RESOURCES

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is true, one would expect many aboriginal sites to occur at high elevations along the stream valleys in positions offering commanding views of large sections of valley.

### ARCHEOLOGICAL BACKGROUND

#### INTRODUCTION

The following archeological summary and background is divided into three main sections: separate presentations of the regional archeological background and the previous work in the project vicinity, and a synthesis and discussion of current hypotheses about the region. The first two sections provide a history of previous work in the Panhandle Plains region; the third presents an interpretive discussion of the ideas, theories and hypotheses presented in the literature by those researchers who have worked in the region.

A standard set of terms is used throughout the text to define the temporal and cultural phases within the area. The terms are based on the four major stages of cultural development recognized in Texas: the Paleoindian, Archaic, Late Prehistoric and Historic stages. Some of these stages can be divided into more discrete units and temporal parameters can sometimes be defined: the Paleoindian Stage ends about 8,000 B.P.; the Archaic is commonly segmented into early, middle and late periods; the Late Prehistoric ends at the time of European contact. Very few absolute dates are known for the area, so the chronologic relationship of the stages and periods is relative at this time.

Various researchers use differing terms to define the basic cultural outline presented above. The chronological units listed above will be used in this text to avoid confusion and contradiction of terms and concepts.

#### REGIONAL BACKGROUND

The region of study encompasses a 28-county area which is defined on the basis of gross physiographic and cultural homogeneity. The area includes Baylor, Borden, Briscoe, Callahan, Childress, Cottle, Crosby, Dickens, Fisher, Floyd, Foard, Garza, Hall, Hardeman, Haskell, Jones, Kent, King, Knox, Mitchell, Motley, Nolan, Scurry, Shackelford, Stonewall, Taylor, Throckmorton and Wilbarger counties. Over 1200 sites in these counties have been reported to the Texas Archeological Research Laboratory of The University of Texas at Austin.

These counties lie below the Cap Rock Escarpment and north of the Edwards Plateau in the Gypsum or Osage Plains Physiographic Region (Arbingast et al. 1973). Distinct, well-defined cultural complexes have been recognized for the surrounding areas. However, the core of this defined region is, as yet, poorly defined and not well understood. Archeological investigations in the study area have been sporadic. The

majority of the large-scale, intensive investigations were conducted for specific projects in recent years. Most of these investigations were done in conjunction with major surface-alteration projects such as inundation and dam construction projects.

#### Early Work

The earliest investigations in the region were conducted in the 1920s and 1930s for the University of Texas by A. T. Jackson, G. E. Arnold and J. E. Pearce in Jones, Nolan, Shackelford, Taylor and Young counties. Cyrus N. Ray also did extensive work in these counties, particularly in the Abilene vicinity. He reported his work in numerous articles and manuscripts. Many of these early studies focused on the occurrence of Pleistocene fauna in conjunction with Paleoindian cultural materials rather than on more general investigations of the area and those sites dating to the Archaic and post-Archaic stages.

#### Suhm, Krieger and Jelks: Initial Synthesis

It was not until the mid-1940s that a taxonomic ordering of the cultural groups of Texas was set forth (Krieger 1946). Based on this preliminary work, Suhm et al. (1954) published a classification of the projectile point and pottery types common in Texas and integrated these within a cultural and chronological framework.

The study area is included in the Panhandle-Plains Area defined by Suhm et al. (1954:63), for which a few stages, foci and aspects within the McKern system were proposed. Some have been revised; however, many have yet to be assessed as valid cultural constructs due to the lack of relevant data.

The Paleoindian Stage had been defined for this region, with Clovis, Folsom, Plainview, Scottsbluff, Eden and Angostura projectile points represented. A list of Paleo sites which had been subjected to controlled excavations was compiled (Suhm et al. 1954:65-66).

No sites assigned to the Archaic Stage had been located where a definitive complex could be defined. More recent work has revealed that Archaic Stage sites are present; however, no formal cultural units have been proposed for the region.

The Late Prehistoric period (also called Neo-Indian or Neo-American) was recognized and termed the Antelope Creek Focus within the geographic area along the Canadian River and its tributaries. This focus shares similar cultural manifestations with the Puebloan groups of New Mexico (Suhm et al. 1954:67) although other researchers recognize similarities with the Great Plains.

No archeological complexes were defined for the Historic Stage (Suhm et al. 1954:73) as it was not possible to assign specific sites or site types to the known historic tribes (Apache, Comanche and Kiowa). However, early explorers report that these and other tribes were encountered during their expeditions (Suhm et al. 1954:73).



## PART 1: PREHISTORIC RESOURCES

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### Miscellaneous Investigations of Recent Decades

During the 1950s and 1960s, investigations by professional and amateur archeologists intensified and resulted in the identification of many of the sites on record at the Texas Archeological Research Laboratory in Austin. Members of the South Plains Archeological Society documented the majority of the 237 sites recorded in Garza County and numerous other sites in the surrounding counties. But for the extensive work conducted by the amateur archeologists in the northwest Texas region, little would be known today about the area.

Word conducted excavations at the Floydada Country Club Site (Word 1963) and the Montgomery Site (Word 1965) in Floyd County. The Floydada Country Club Site produced Archaic and Late Prehistoric style projectile points. Although the collection recovered was dominated by diagnostics of the latter period, Word suggested that additional investigations would produce more Archaic material. Thus, a more intensive Archaic occupation than the initial excavation revealed is inferred. This site also produced artifactual material from Puebloan groups to the west. Similar expressions are found in other sites in the area as well.

The Montgomery Site was occupied during the Late Prehistoric and early Historic stages (Word 1965). The excavations produced ceramic materials from both western Puebloan and eastern Caddoan groups which date to between A.D. 1200 and 1500.

Runkles (1964) reported the excavations conducted by the South Plains Archeological Society at the Garza Site, an open campsite located on a low terrace along an unnamed stream. Their excavations revealed hearths, concentrations of bison bone splinters, an accumulation of chipping debris and a possible grinding stone cache (Runkles 1964:115). One of the more important results of this excavation was the definition of the Garza point, a triangular arrow point with a central basal notch, which was believed to be associated with the Late Prehistoric occupation of the site. This distinctive type has been identified at other sites in the Panhandle-Plains region (Runkles 1964:123). More recent studies have shown that the Garza point and associated occupations should be attributed to the Historic Stage (Johnson et al. 1977:104). Radiocarbon assays made from Garza occupations at the Lubbock Lake Site provide dates of A.D. 1585 to 1685 and A.D. 1605 to 1725 (Johnson et al. 1977:104).

In 1966, Parsons excavated portions of the Pete Creek and the Morgan Jones sites in Crosby County and recorded four additional sites in the nearby areas of Crosby and Dickens counties (Parsons 1967). The Pete Creek Site is an open campsite located along Pete Creek, a tributary to the White River. Excavation revealed numerous hearths, concentrations of bison bone and two pits (Parsons 1967:13-15). Projectile point types indicate that the heaviest occupation of the site occurred during the Late Prehistoric. This is represented by Harrell, Washita and a few Garza arrow points as well as ground stone and specialized tools such as graters, drills and spokeshaves. A few dart points were

recovered and suggest that a limited Archaic occupation of the site also occurred.

Over 300 ceramic sherds were recovered from the Pete Creek Site; included are Rio Grande Glaze VI and other utilitarian wares of late (A.D. 1670-1700) Puebloan origin. Other sherds reflected the east Texas ceramic tradition. A few sherds were similar to a form found in Henrietta Focus sites (Parsons 1967:61), and others exhibit characteristics of Bullard Brushed, a Late Caddoan type which was widely traded in central and western Texas.

Parsons believes the later and more intensive occupation at Pete Creek must be attributed to eastern plains Apache groups, who are known to have traded with the Puebloan peoples (Parsons 1967:78). He suggests that the earlier occupations of the site were made by prehistoric nomadic populations, largely during post-Archaic times.

The site provides information about the range of influence from neighboring cultures into this region; the presence of Puebloan and Caddoan ceramics suggests some trade network existed between these areas. The presence of multiple repeated components at this site, ranging chronologically from the Archaic Stage through the Historic Stage, indicates that certain preferred locales were repeatedly visited. Other excavated sites from this region (such as the Floydada Country Club and the Lubbock Lake sites) also have occupational debris spanning many centuries.

The Morgan Jones Site is located near the head of a tributary to Sand Creek, which empties into the White River. The site is a small rockshelter just below the escarpment of the Llano Estacado which contained a single flexed human burial with associated grave goods. Excavation yielded numerous historic artifacts including glass beads, a metal belt buckle, an iron ax and a brass cinch buckle as well as whelk shell and elk tooth pendants. The manufacture of the brass buckle was dated to between A.D. 1790 and 1820 (Parsons 1967:91). Parsons believes the position of the body, the character of the grave goods and the time period indicate the interment was of Comanche origin (Parsons 1967:93). A skeletal analysis determined the body was that of an adolescent female between 13- and 15-years-of-age (Butler 1967:105).

#### Miller Creek Reservoir

In November 1969, Malone and Briggs conducted a survey of the Miller Creek Reservoir area in Baylor and Throckmorton counties resulting in the location of 21 sites. The survey initially attempted to cover 100 percent of the 3400-acre survey area. However, as it became apparent that many sites were located in predictable locations, the survey concentrated on relatively undisturbed, high probability areas.

The sites were located within three physiographic zones: along the creek channels and banks, with 16 sites (76.1%) identified; in the active floodplain, with 3 sites (14.3%) identified; and on alluvial terraces with 2 sites (9.5%) identified (Malone and Briggs 1970:18). Sites

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were typically identified in disturbed areas such as cutbanks, roadcuts, slump areas and plowed fields. The surface artifact density at all of the sites was low. Hearths of burned limestone were present at many of the sites. No ceramics or projectile points were found at any of the sites, rendering any assessment of their cultural or chronological origins problematic. The authors state, however, that "the limited evidence presented by the sites and their surface artifacts is reminiscent of sites attributed to Archaic cultures in North-Central Texas" (Malone and Briggs 1970:42).

### Mackenzie Reservoir

In 1970, Malone conducted a survey of Mackenzie Reservoir in Tule Canyon in Swisher and Briscoe counties, resulting in the identification of 77 sites. A general settlement pattern was presented which was based on site locations. Eighty percent ( $n = 61$ ) of the sites located during the survey are situated to the north of Tule Creek, while the remaining 20 percent (or 16 sites) are located to the south of the creek (Malone 1970:21). Water is more plentiful in the northern section of the canyon, and access into and out of the canyon is easier in this section than in the southern section.

Ninety-two percent (71) of the sites were open campsites characterized by concentrations of fire-cracked rock in oval and circular patterns. These campsites occurred in three topographic settings: on level areas above the canyons; along the canyon rims; and below the canyon rims on alluvial terraces and bedrock benches. Three half-dugouts were located during the survey; all were constructed during the 1890s. Mammoth bone fragments were recorded at one locality, but there was no associated evidence of human activity.

The few diagnostics recovered by the Mackenzie survey indicate that aboriginal groups in areas to the north, northeast and southeast exerted the greatest influence on the people inhabiting the Tule Canyon area (Malone 1970:53). Late Prehistoric occupations were evidenced by the presence of arrow points characteristic of the Antelope Creek, Henrietta and Wylie foci. Middle and late Archaic dart point styles were also present.

A salvage testing program of nine sites within the Mackenzie Reservoir area was conducted in 1973-1974 and reported by Hughes and Willey in 1978. Selection of sites to be tested was based primarily on how soon they would be destroyed by construction or flooding, and, secondarily, on their archeological promise (Hughes and Willey 1978:45). Construction was well under way when this archeological investigation began; several sites had already been destroyed while others were in danger of immediate destruction. The sites threatened by the remaining construction were tested first, and the low-lying sites to be destroyed by water or wave erosion were given second priority. As a result, all of the sites excavated are located in the canyon bottom (Hughes and Willey 1978:45).

The Rex Rodgers Site is a bison kill site which revealed the bones of at least six bison of an extinct species and five associated projectile points. Near the bison bones was a bed of mammoth bones; however, no evidence of human association was found with the mammoth remains. An examination of the strata and deposition of the site indicates that,

. . . the bison were killed on a low bench of floodplain alluvium at the edge of a broad sandy stream channel, in the mouth of a small gully in the talus deposits at the foot of the canyon wall (Hughes and Willey 1978:60).

In more recent times, the stream channel has shifted east of the kill area and cut deeper. Erosion of the canyon wall west of the site resulted in the exposure of the bison bone bed and the mammoth bones.

The five projectile points recovered were grouped into two forms; the first group was termed "Unnotched Lanceolate," the second was termed "Side-Hollowed" (Hughes and Willey 1978:64). Neither group could be classified into the established Paleoindian projectile point types. They do, however, exhibit some of the characteristics of these types. Other archeologists have suggested the side-hollowed points may relate to the type San Patrice (Robert Bell and Dee Ann Story, personal communications, 1974, cited in Hughes and Willey 1978:66).

No radiocarbon dates were available at the time the report was prepared. The dates assigned to the site are based on the dates assigned to similar projectile points from other sites. A rough estimate of the age of the Rex Rodgers specimens is between 10,500 and 9,000 B.P.

Two of the sites, the County Line and Blue Clay sites, are assigned to the transitional phase between the Archaic and Late Prehistoric stages on the basis of projectile point styles and associated artifacts. The County Line Site produced no pottery, but the projectile point styles exhibited characteristics common to both dart and arrow points. The Blue Clay site produced pottery and both dart and arrow points.

The Deadman's Shelter Site is a stratified Late Prehistoric rock-shelter with two periods of occupation. The earlier occupation contained numerous hearths, dart and arrow points and pottery. Radiocarbon assays of samples associated with this occupation yielded dates of A.D. 60 to 180 and A.D. 170 to 250. The site was excavated to approximately 2 meters below the surface although it continues to an undetermined depth. The later occupation was dated at A.D. 395 to 535 and A.D. 645 to 775. No dart points were recovered from this occupation; the arrow points recovered were distinctive and given the name Deadman's (Hughes and Willey 1978:280). In addition, partial remains of a human skeleton were recovered.

The Deadman's Terrace Site is located on a terrace below the shelter described above. Excavations revealed numerous hearths which were different in shape and material from those found elsewhere in the reservoir area. The hearths were composed of large, thin, flat sandstone slabs which were usually fractured with ash, charcoal and sometimes

## PART 1: PREHISTORIC RESOURCES

burned bone beneath them (Hughes and Willey 1978:220). The artifacts recovered from the site suggest predominantly Late Prehistoric occupation, although the stratigraphy and the presence of recent material suggest multiple occupations of the terrace.

The Road Cut Site was partially destroyed by construction prior to excavation. One basin-shaped hearth was excavated, and a cache of Tecovas jasper was found near the site. The few artifacts recovered indicate a Late Prehistoric occupation (Hughes and Willey 1978:226).

The Snail Bed Site contained a rock-lined, basin-shaped hearth but little other associated material. The authors suggest the site was Late Prehistoric based on the few artifacts recovered (Hughes and Willey 1978:280).

The Sand Pit and Sandstone Ledge sites are the only Historic sites excavated. The former site was believed to be a Comanche camp based on the nature of the recovered material. This may be the only historic Indian site from the Panhandle that has been excavated and reported (Hughes and Willey 1978:251).

The Sandstone Ledge Site consists of an alluvial terrace below a sandstone face in an overhang ledge. The terrace contains hearths and historic aboriginal artifacts; the ledge contains 27 petroglyphs across the face. It was not possible to determine the age of the rock art and the association with the material on the terrace below. Hughes and Willey (1978:264) suggest that scratched and grooved designs appear later than pecked designs, which may place the petroglyphs in the same relative time period as the occupation of the terrace below.

Katz and Katz (1976) conducted an intensive survey of lower Tule Canyon immediately below the Mackenzie Reservoir basin in 1976 and located an additional 90 prehistoric sites. The preliminary survey strategy used was to examine the canyon using multiple transects which crosscut the canyon from rim to rim, and lateral transects which included the rims and bottomlands in order to adequately sample all environmental zones within the study area. Four major topographic zones in which sites occurred regularly were defined: the rim, knolls, terraces and mouth. Their physiographic classification is not compatible with that used by the present survey. The investigators switched from transects to intensive examination of these zones in the middle of the field season. After the survey had been completed, a testing phase was implemented. An attempt was made to test at least one site from each of the four topographic zones (Katz and Katz 1976:29) resulting in the testing of nine sites. The testing did not provide much information beyond what had been gathered during the survey stage. Most of the sites were surficial due to deflation processes which removed the majority of the occupational levels. Katz and Katz conclude that testing is not necessary to understand the chronology and intersite relationships (Katz and Katz 1976:59).

The artifacts recovered which indicate temporal association include the tip of a projectile point or cutting tool assigned to the Late

Paleoindian Stage; 4 late Archaic dart points; and 13 arrow points and 10 potsherds assigned to the Late Prehistoric.

#### PREVIOUS WORK IN THE PROJECT VICINITY

##### Wichita River Chloride Control Project

Hughes (1972) conducted a reconnaissance survey of areas in the Wichita River drainage in Cottle, Foard, King and Knox counties for the Tulsa District Corps of Engineers, as part of an environmental impact statement for the Wichita River Chloride Control Project. Six potential reservoir areas in these counties were briefly examined over a 10-day period resulting in the identification of 35 sites (Hughes 1972:2-39). The investigation concentrated on the most accessible and promising portions of the study area due to the limited time and money budgeted for the project (Hughes 1972:2-31).

Materials were collected from each of the sites located in order to provide preliminary data about the range in dates, exploitive strategies and cultural affinities within the area. The lithic materials appear to have come from the gravels of the local Seymour Formation which consists of redeposited gravels derived from the Potter Formation to the west. Also included were Alibates agate, Tecovas jasper, Edwards flint and local sandstones, dolomites and caliche.

The majority of the sites located indicate an Archaic subsistence base with artifacts which correspond to the period associated with this stage.

Hughes stated that the scope of his study was too limited to make definitive statements about the cultural resources of the area. He believed, however, that the location of 35 sites during this brief study indicated the potential for the presence of many more sites and recommended that more intensive investigations be undertaken (Hughes 1972:2-46).

##### Truscott Reservoir

In 1977, personnel from West Texas State University thoroughly investigated three of the areas in King and Knox counties which were included in the 1972 survey (Etchieson et al. 1978): the Bateman Pumping Station, Bateman to Truscott pipeline and Truscott Brine Lake. A total of 76 sites (67 aboriginal, 3 historic and 6 paleontological) were identified during the course of this project. Collections were made at most of the sites; the procedures ranged from general collection to controlled collection to testing, depending on the surficial exposure and degree of intactness at each site.

The authors defined seven topographic/geologic locations in which sites occurred: (1) Pleistocene rim; (2) Permian bench-bluff; (3) Permian bench-edge; (4) Permian bench-foot; (5) Permian terrace; (6) Quaternary terrace; and (7) divide (Etchieson et al. 1978:70). Category

## PART 1: PREHISTORIC RESOURCES

(1) is equivalent to our canyon rim, categories (2) through (5) to our bedrock bench, category (6) to our terrace, and category (7) to our upland slope. Most of the sites have been subjected to either natural erosion or modern cultural disturbances. The sites on the Permian benches have been subjected to extensive sheetwash; modern disturbances include roadcuts, grazing and land clearing which increase the effects of the natural erosional processes.

The majority of the chronologically classifiable sites fall within the Archaic Stage; division into more discrete temporal phases was difficult in most instances. Late Prehistoric sites were present but less numerous. Most of the recorded sites were classified as "unknown prehistoric" (Etchieson et al. 1978:Table 5). An attempt was made to correlate the Archaic sequences of this area with the phases defined for Central Texas by Weir (1976a, 1976b) and Patterson (1977). A preliminary scheme in tabular form showing the correlation of the two regions was devised and was presented as a tentative model for future research (Etchieson et al. 1978:85-87). Their correlation is reproduced in Table 3.

The sites are open camps for which various functions and activities could be inferred, including food processing, temporary camps, quarrying and butchering. Seven sites were tested and resulted in the exposure of numerous burned rock concentrations. Few of the sites had subsurface deposits due to the amount of sheetwash in the project area.

### Crowell Reservoir

The second phase of intensive survey of the Wichita River Chloride Control Project was conducted by West Texas State University in 1978 (Etchieson et al. 1979). This project included examination of five proposed structures in Cottle, Foard, King and Knox counties: Crowell Brine Lake, Lowrance Pumping Station, Lowrance Pipeline, Y Ranch Pumping Station and Y Ranch Pipeline, totaling approximately 7800 acres. One hundred and fifty-four sites were recorded during this survey. Most were surficial with extensive exposures. No collections were made at 64 sites while only diagnostics were collected from 30 sites. A semicontrolled collection procedure was used at 12 sites. Six sites were tested using controlled excavation techniques. The remaining 57 sites were collected using uncontrolled total recovery methods. The sites in the reservoir occur along four "terraces," the first (Quaternary alluvium), second (intermediate bedrock benches), third (a high strath terrace), and fourth (the canyon rim). The pipeline and pump station sites occupy Quaternary terraces, "Permian benches" (equivalent to our bedrock benches), and "Permian Ridge" (upland slopes).

The chronological sequence defined for the Truscott Reservoir project area was used as an interpretive framework for the Crowell material. Three sites yielded Paleoindian projectile points, but these came from sites which contain predominantly Archaic occupations. All but two of the sites which yielded diagnostic artifacts exhibited dart points assigned to the Archaic Stage. The investigators considered the numerous gouges recovered to represent late Paleoindian and early to middle

TABLE 3  
PROPOSED CORRELATION OF ARCHAIC SEQUENCES IN CENTRAL TEXAS  
AND THE ROLLING PLAINS AS INDICATED BY DART-POINT TYPES  
(Etchieson et al. 1978:86).

| CENTRAL TEXAS ARCHAIC STAGE |  | ROLLING PLAINS ARCHAIC STAGE |  |
|-----------------------------|--|------------------------------|--|
| Phase                       | Point Types  | Substage                     | Point Types  |
| 670 B.P.                    | Darl<br>Ensor<br>Fairland<br>Frio  | 1200 A.D.                    | Carrizo<br>Catan<br>Darl<br>Elam                                   |
| TWIN<br>SISTERS             | Kinney   | TERMINAL                     | Ensor<br>Fairland<br>Frio<br>Kent<br>Palmillas<br>Yarbrough        |
| 1690 B.P.                   |  | c. 1 A.D.                    |  |
|                             | Castroville<br>Ensor<br>Exp. stem pts.<br>Frio<br>Lange<br>Marcos<br>Marshall<br>Montell | LATE                         | Castroville<br>Ellis<br>Lange<br>cf. Marcos<br>Trinity<br>Williams |
| SAN<br>MARCOS               | Williams   | c. 1000 B.C.                 |  |
|                             | Bulverde<br>Langtry<br>Marshall<br>Pedernales  | MIDDLE                       | Bulverde<br>McKean<br>Pedernales                                   |
| ROUND<br>ROCK               | Val Verde  | c. 2000 B.C.                 |  |
|                             | Bulverde<br>Nolan<br>Pandale<br>Tortugas<br>Travis                                       | EARLY                        | Bulverde<br>Tortugas<br>Wells                                      |
| CLEAR<br>FORK               | Wells  | c. 3000 B.C.                 |  |
|                             | Angostura<br>Bell<br>"Early Barbed"<br>Gower<br>Martindale<br>Tortugas<br>Uvalde         | INITIAL                      | Tortugas   |
| SAN<br>GERONIMO             |  | c. 5000 B.C.                 |  |



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Archaic occupations (Etchieson et al. 1979:353). However, no initial Archaic dart points and only one early Archaic dart point were recovered. The lack of projectile points from the early subphases is not understood, if the gouges do represent these early subphases (Etchieson et al. 1979:353). Late Prehistoric occupations were present although most sites with components of this later complex contained more intensive Archaic occupations (Etchieson et al. 1979:356).

The 10 historic sites include dugouts, copper mines and smelters, corrals, historic scatters and habitation sites (houses with associated cultivated fields, cisterns and outbuildings). The two smelter sites were the only resources within the project area considered to be worthy of nomination to the National Register of Historic Places.

### Brazos Natural Salt Pollution Control Project

A preliminary reconnaissance of approximately 5000 acres within three proposed damsite areas (10, 14 and 19) of the Brazos Natural Salt Pollution Control Project was conducted by Southern Methodist University under the direction of S. Alan Skinner in 1973. The survey resulted in the identification of 30 sites and 56 localities. A locality was defined by the number of pieces of cultural material per unit area. Sites, on the other hand, "contained a large number of lithic pieces within a relatively restricted area" (Skinner 1973:8). No absolute method of quantification was devised in order to distinguish between sites and localities. No descriptions or specific locational information were recorded for the localities identified.

All of the sites located are open camps; no rockshelters or evidence of structures were found. Erosion had disturbed many of the sites resulting in the material being dispersed and the areas deflated. Various topographic locations were used by prehistoric peoples, and no correlation of preferred location through time was suggested.

The majority of sites could not be integrated into known time periods; all sites, however, appeared to have been the result of nomadic tribes using the area and engaged in a hunting-gathering subsistence strategy. Based on associated diagnostic material, six of the sites were identified as Archaic and two as Late Prehistoric.

Skinner tested four models of aboriginal subsistence and settlement during the study; two were rejected, but two were deemed worthy of more investigation to determine if, indeed, they were valid. These latter two were termed "central-based wanderer community pattern" and "restricted wanderer community pattern" (Skinner 1973:6). The former model suggests that the prehistoric use of the area would include base camps located along the main drainage, the Salt Fork of the Brazos River, and near economically valuable resources, with temporary, activity-specific sites along the major tributaries. Skinner expected these sites to be stratified with a wide range and variation of artifacts (Skinner 1973:24). The latter model suggests that sites of similar size and nature would be found throughout the project area reflecting a hunter-gatherer

economic-based group of stable size and social composition (Skinner 1973:24).

Skinner recommended an intensive survey of the entire Upper Brazos region in order to establish the settlement pattern of the area so that the two models might be tested. He did not believe that the data recovered from this preliminary reconnaissance survey were sufficient to adequately assess and interpret the cultural resources of the project area.

#### SYNTHESIS AND REVIEW OF PREVIOUS INVESTIGATIONS

The archeological investigations in the defined region of study have revealed a complex and, as yet, poorly understood cultural expression which ranges through time from the late Pleistocene to the present.

Components of the Paleoindian Stage seem to follow the economic subsistence strategy observed in adjacent areas for the period; a reliance on big-game hunting with the archeological sites revealing bison bone beds and projectile point styles common throughout the late Pleistocene period. Unusual projectile point styles were recovered from the Rex Rodgers Site in Briscoe County in association with extinct bison species. Other sites revealed possible Paleoindian occupations as diagnostic projectile points were recovered. These occupations, however, did not always exhibit the megafauna association which typifies Pleistocene-age sites. Various hypotheses have been suggested for this lack of associated material. The most common is that the projectile points may have been found elsewhere by later peoples and left at sites which were not occupied by Paleoindians (Etchieson et al. 1979:353).

Another hypothesis suggests that a more varied economic adaptive strategy was utilized by Paleoindians than has been recognized. The megafauna bone bed with associated projectile points (kill site) is typical of this period; however, small seasonal camps and processing areas may also have occurred which are not usually identified as Paleoindian sites. The excavations conducted at the Lake Theo Site in Briscoe County indicated that this site was a Paleoindian butchering area with an associated camp area although little material was identified to substantiate that the area was actually used as a camp (Harrison and Killen 1978:87).

The Adair-Steadman Site, excavated by the Texas Historical Commission, has been interpreted as a Paleoindian camp. No faunal material was recovered from this site located in Fisher County. However, numerous distinctive Paleoindian tools and projectile points (Folsom points) were found (Tunnell 1975). This site is just south of the project area, and it supports the hypothesis that Paleoindian camps exist without associated fauna.

The most commonly encountered site type in the general region of study is the lithic scatter typical of the Archaic Stage. Many of these sites could not be more discretely classified into the early, middle and

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late Archaic periods usually defined for this stage. In most instances where diagnostics have been found, they seem to be of late Archaic association. The noted dearth of early and middle Archaic components has been a topic of interest to researchers working in this region. Numerous hypotheses have been presented to account for this lack of information, but none have been substantiated.

Etchieson et al. (1978, 1979) suggest that gouges may be indicative of early to middle Archaic occupations. There are no supporting data, however, to verify this; very few early Archaic projectile point styles have been recovered from sites located within the study area, and no radiocarbon or other forms of absolute dating have been attempted to substantiate this interpretation. Gouges have been found as late as the Austin Phase in Central Texas (Prewitt 1981:82-83). Although gouges have been found in early to middle Archaic occupations, the conclusion that they indicate occupations of only these periods seems untenable.

Late Archaic sites, identified by the presence of presumed late dart point styles, have been documented throughout the project region. The apparent gap between the late Pleistocene and the late Archaic is not yet understood.

It must be noted that the relative chronology of this area is based on absolute and relative dates from sites in surrounding regions. Blackwater Draw and the Lubbock Lake sites have occupations later than Paleoindian; stratigraphic separation and absolute dates from these strata have formed the basis of dating of some of the later artifact styles. Absolute dates from central Texas have allowed dating of projectile point styles. It is this chronological scheme which serves as the basis for dating artifacts and sites in the Panhandle Plains region.

Late Prehistoric sites are generally less numerous than Archaic sites but are present in most areas. Although the general subsistence base of the Late Prehistoric does not change from the Archaic, the innovation of the bow and arrow is noted in the tool kit remains. No conclusive evidence of agriculture has been found although some areas adjacent to sites seem suitable for cultivation (Malone 1970). No substantiated explanation has been presented which explains the paucity of recognized Late Prehistoric sites and the marked contrast to the abundance of late Archaic sites. Some believe that at this time there was a change from small local hunting and gathering groups to more of an emphasis on migrations following bison herds (Etchieson et al. 1979:355) over wide geographic areas.

Distinctive projectile point styles such as Harrell and Garza are associated with this stage, although recent studies have shown that the Garza occupation at the Lubbock Lake Site was later (Johnson et al. 1977). It must be noted that more research is needed to define beginning and ending dates for the Garza point before we can state that all Garza occupations are late.

Late Prehistoric sites were found by Parsons (1967), Malone (1970), Katz and Katz (1976), Hughes and Willey (1978) and Etchieson et al.

(1978, 1979). Skinner (1973) found two sites with Late Prehistoric components.

The only attempt to place sites into culturally meaningful groups was made by Etchieson et al. (1978, 1979). The single cultural synthesis attempted prior to this work was Krieger's (1946) definition of the Antelope Creek Focus of the Panhandle Aspect and was followed by Suhm et al.'s (1954) elaboration of this scheme. Research accomplished since that time has shown that the Antelope Creek Focus, as defined, does not accommodate the majority of the sites located within this region. The term Panhandle Aspect has been used as a catchall for these sites but is very general.

Clearly, the various chronological constructs proposed for the Rolling Plains must be viewed as extremely tentative at present. A substantial data base has been accumulated for the region in recent years, and the opportunity now exists for a more sophisticated synthesis of its cultural history and processes to be made. Such an undertaking is beyond the schedule constraints of contract archeology since detailed reanalysis of existing collections and documentation will be required. However, it must be realized that the establishment of component contemporaneity is an indispensable prerequisite to all studies of culture process, and pending the development of a reliable regional chronology, the formulation of models concerning aboriginal patterns of subsistence, settlement and social organization must be pursued with caution.

## RESEARCH DESIGN AND METHODS

### INTRODUCTION

In this section, the research design which served as the organizational basis for the survey and the field methods employed in its execution are reviewed. The prefield archival research is discussed first, then the manner in which the survey sample was selected is described. The survey methods employed in the coverage of that sample are reviewed. Finally, the investigations of the special consultants are summarized.

### RECORDS AND LITERATURE REVIEW

Prior to the initiation of the field investigations, archival research was conducted in order to: (1) ensure the identification of all previously recorded archeological sites within the project area, and (2) establish for the Project Archeologist a working familiarity with the character and physiographic distribution of archeological sites known to occur within the region incorporating the project area.

The available published literature for the immediate surrounding area was reviewed. Particularly useful were the reports of the Crowell and Truscott reservoir surveys (Etchieson et al. 1978, 1979) performed immediately northeast of the project area. A report of the initial

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reconnaissance of the project area (Skinner 1973) provided useful data on previously recorded sites.

The records of five institutions were then inspected in order to gather all available site-specific documentation relevant to the immediate project area: the Texas Historical Commission (THC) and the Texas Archeological Research Laboratory (TARL) in Austin, the Texas Tech University Museum in Lubbock, West Texas State University in Canyon and Southern Methodist University (SMU) in Dallas. Only the files of SMU contained any such documentation: the survey forms and location plottings of the sites recorded by Skinner in 1973. All of this information was photocopied for use during the course of the field investigations and analysis.

Finally, a prominent avocational archeologist who has been active in the northwest Texas region for many years, James H. Word of Floydada, was interviewed. Mr. Word has not recorded any sites within the project area, nor was he aware of any locally active amateurs who might have done so. However, his insights into the character and distribution of archeological sites within the region proved invaluable.

### DEFINITION OF THE SURVEY SAMPLE

The scope of work prepared by the Corps of Engineers called for a pedestrian survey of a stratified random sample of at least 25 percent of the total reservoir acreage and pipeline easement mileage. The units of survey chosen consist of 500x500-meter quadrats oriented on the Universal Transverse Mercator (UTM) grid (Edwards 1969). In order to define the sample universe, the reservoir basins and pipeline easements were carefully plotted on a set of relevant USGS 7.5' (1:24 000-scale) topographic maps (the Bob Creek, Jayton, Kiowa Peak, Kiowa Peak NE, Kiowa Peak NW, Kiowa Peak SW, Pursley House, Seven Diamond L Canyon, and Southerland Canyon sheets). The 500-meter grid was then imposed over each reservoir basin and pipeline easement segment by simply quartering the relevant UTM square-kilometer units. Survey units within the reservoir basin which contained less than 10 acres of reservoir area were excluded from the sample universe.

Environmental data available prior to the fieldwork were insufficient to permit the definition of sophisticated sample strata based on microenvironmental zones. Therefore, a rather simple but readily definable tripartite sample stratification was chosen. The reservoir basin survey units were divided into two strata on the basis of stream ranking: Stratum A contains the units within the mainstem valleys of Croton, Salt Croton and North Croton creeks (215 survey units); and Stratum B incorporates the units within the tributary valleys of Bitter Gulch, Pen Branch, Bradley, Cottonwood, Haystack, Hot Springs, Salt, Short Croton, Smelter, Southerland and Wedington creeks, and various unnamed tributaries of the reservoir basin mainstems (211 survey units). Finally, a third stratum was defined, Stratum C, which includes all of the survey units along the pipeline easement (84 survey units). A

summary of the survey units associated with each project segment is presented in Table 4.

TABLE 4  
SURVEY UNITS BY PROJECT AREA SEGMENT

Dam Site 10

Stratum A: Survey Units A-1 through A-58  
Stratum B: Survey Units B-1 through B-51

Dam Site 14

Stratum A: Survey Units A-59 through A-87  
Stratum B: Survey Units B-52 through B-66

Dam Site 19

Stratum A: Survey Units A-88 through A-215  
Stratum B: Survey Units B-67 through B-211

West Pipeline

Stratum C: Survey Units C-1 through C-31

East Pipeline

Stratum C: Survey Units C-32 through C-84

To select a sample, the survey units within each stratum were numbered sequentially from west to east. Each unit was assigned a two-part designation indicating its stratum association and place within the sequence (e.g., A-93, B-151). Random number tables were generated for each stratum, using the multiplicative congruential method. The acreage of reservoir basin or mileage of pipeline easement contained in each survey unit was calculated and tabulated by stratum. Within the reservoir basins, only the acreage of each survey unit inside the floodpool boundary was counted. A complete unit contains 62 acres, but the effective acreage thus defined of many survey units was actually far less than that.

Finally, a 25 percent random sample of each stratum was selected by simply drawing survey units from the appropriate random number table and adding up the acreage or mileage until the requisite total for the desired sample was met or exceeded. A summary of each stratum sample is presented in Table 5, and the locations and designations of the survey units comprising the total project sample are illustrated in Figures 6 through 8.

TABLE 5  
SUMMARY OF SURVEY SAMPLE BY STRATUM

| Sample Stratum  | Total # of Survey Units | Total Acreage/Mileage* | # of Units Surveyed | Sample Acreage/Mileage* | Percent Sampled |
|-----------------|-------------------------|------------------------|---------------------|-------------------------|-----------------|
| A               | 215                     | 9405                   | 52                  | 2353                    | 25.0            |
| B               | 211                     | 6468                   | 50                  | 1651                    | 25.5            |
| Reservoir Total | 426                     | 15873                  | 102                 | 4004                    | 25.2            |
| C               | 84                      | 21.8                   | 20                  | 5.49                    | 25.2            |

\*The stated figures are in acres for Strata A and B and in miles for Stratum C.

Figure 6

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 10 SURVEY AREA

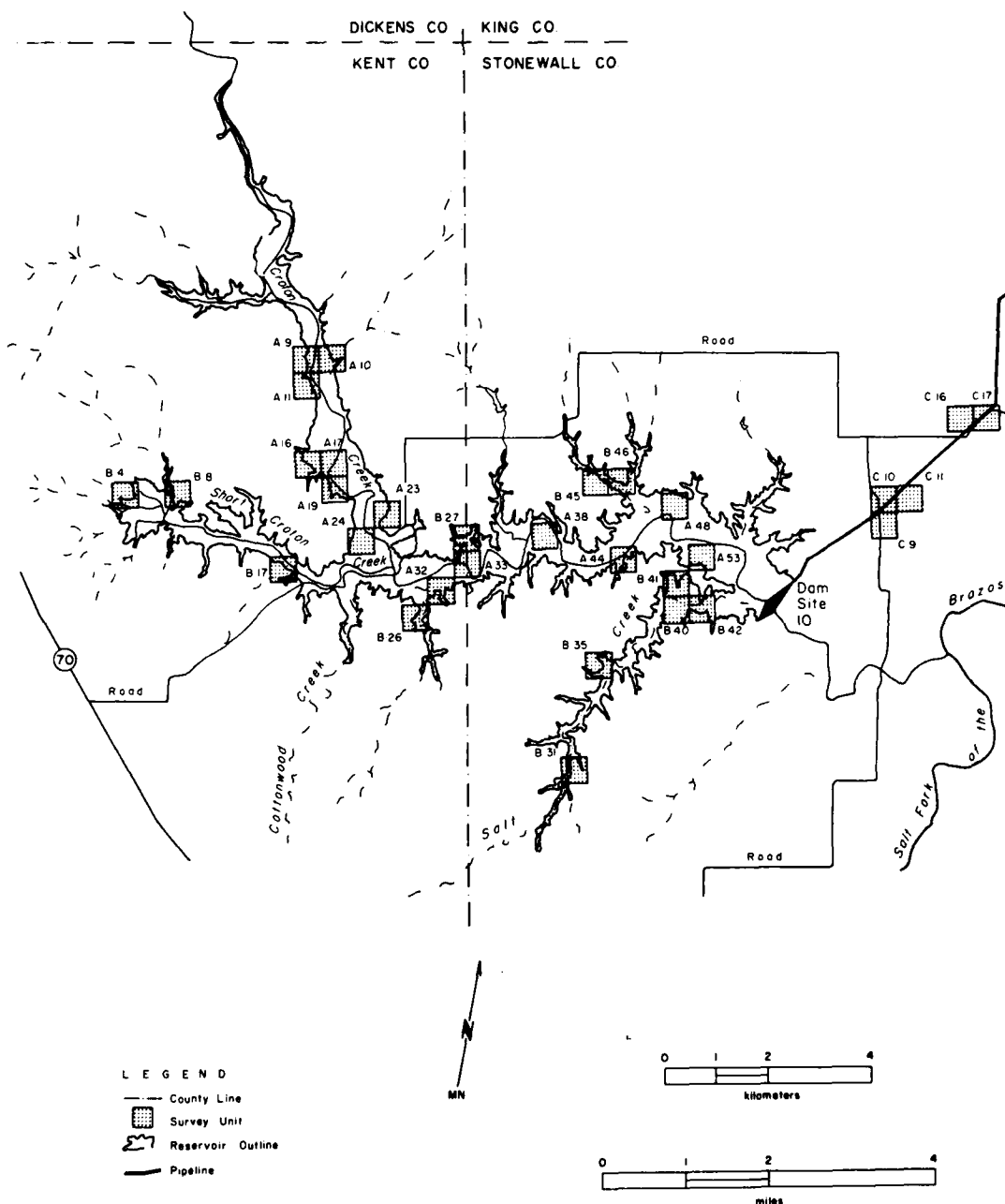
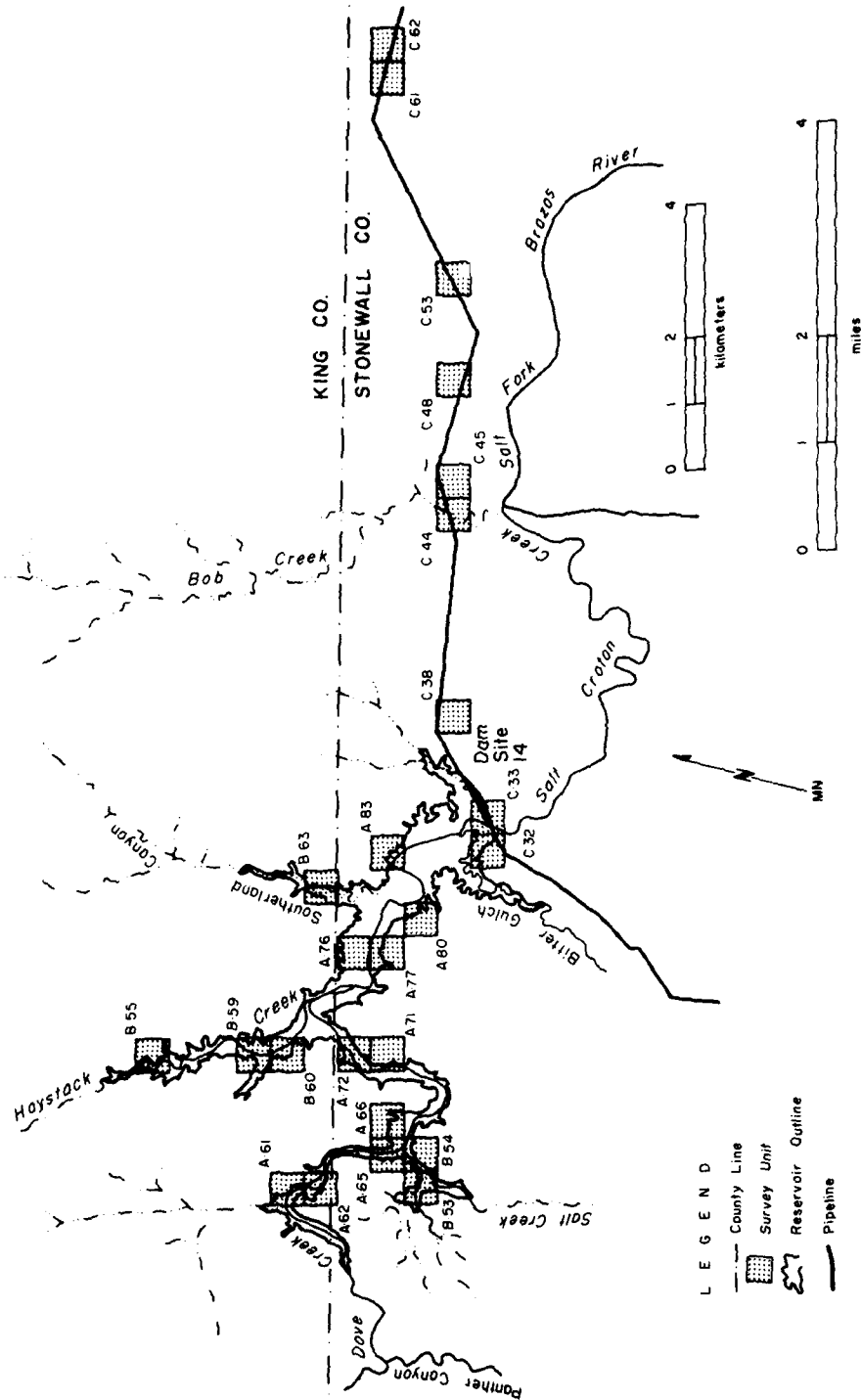




Figure 7

# BRAZOS NATURAL SALT POLLUTION PROJECT

## DAM SITE 14 SURVEY AREA



- LEGEND
- County Line
  - Survey Unit
  - Reservoir Outline
  - Pipeline

Adapted From: USGS, Bob Creek, Lovers Resort, Seven Diamond L. & Southernland Canyon, Texas, 7.5' Sheets, 1958

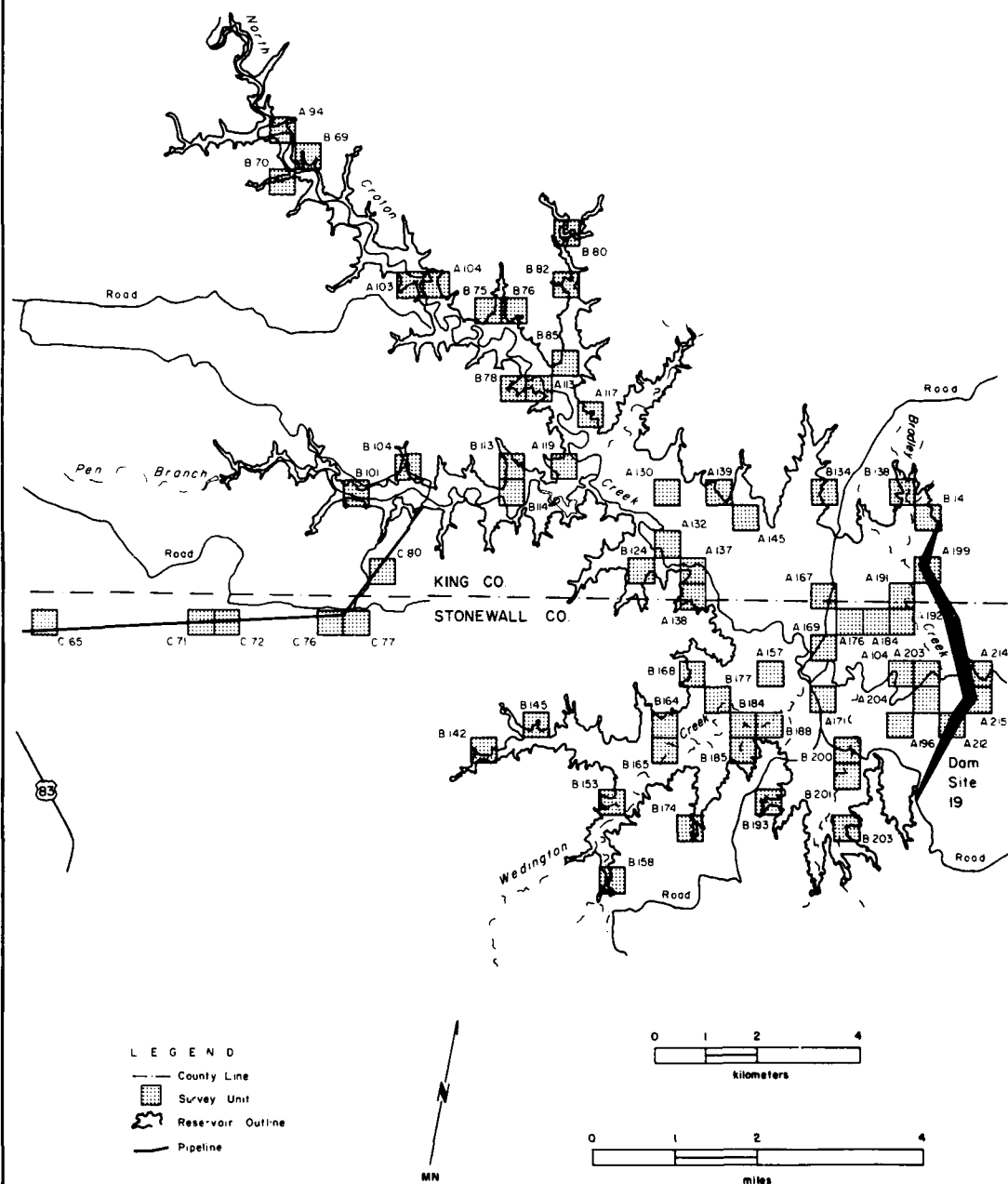
P8A1/81/SHP

Figure 8

# BRAZOS NATURAL SALT POLLUTION PROJECT

DAM SITE 19

SURVEY AREA



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Access difficulties necessitated the rejection of three Stratum C survey units, a total of .88 mile of pipeline easement, during the course of the survey. Three replacement survey units totaling .69 mile of easement were drawn from the random number table. The Stratum C sample was reduced from 5.68 miles to 5.49 miles by this substitution, but even this revised sample is in excess of the sample required by the scope of work (5.45 miles). The Stratum C survey units illustrated in Figures 6 through 8 are those actually surveyed and reflect these substitutions. No other alterations in the survey sample were required by field exigencies.

### SURVEY METHODS

A pedestrian survey of the areas selected for sampling was conducted by a crew of six field assistants divided into two survey crews of three persons each. One individual on each crew was designated crew chief and was held responsible for the leadership of the crew on a day-to-day basis and for the proper completion of all requisite documentation. The Project Archeologist rotated between crews during approximately 60 percent of the survey; the remainder of his time was devoted to access arrangements and field investigations in the company of the environmental consultants. A total of 44 crew days, or 132 person days, was expended in 22 calendar days to complete the archeological survey.

Each survey crew was supplied with a Brunton compass, a 2½-by-2½-inch format camera for black-and-white photographs, a 35 millimeter SLR camera for color slides, copies of the available soil surveys for Kent and Stonewall counties (Goerdel and Watson 1975; Richardson and Girdner 1973), a copy of the Geologic Atlas of Texas, Lubbock Sheet (Barnes 1967), the relevant county highway maps and copies of the USGS 7.5' (1:24 000-scale) topographic maps covering the project area. The USGS maps provided to each crew contained the following information: the locations and designations of the reservoir boundaries, dam sites and pipeline easements; the locations and designations of the sample survey units and the archeological sites located by the SMU reconnaissance; property boundaries and access contacts for each landholding; and preferred access routes into each survey area.

Each crew surveyed an average of 140 to 145 acres per day. Where permitted by terrain, a survey unit was covered in a series of linear transects with the crewmembers spaced 25 to 30 meters apart. However, in extremely rugged terrain, the transects were adapted to follow the contours of the terrain in an efficient manner. A standard form was completed to document each survey unit; summary information regarding physiography, vegetation, and any sites or localities observed within units was recorded on these forms. A sample survey unit record form is included in Appendix IV.

Actually, the survey covered considerably more reservoir basin acreage than is indicated in Table 5. The survey units to be covered by a crew on a given day were often separated by substantial distances, and in traveling from one unit to the next, the crewmembers continued to

look for sites. Every archeological site observed was recorded regardless of its location within or beyond a sample survey unit. Sites extending across survey unit boundaries were followed out to determine their full extent. In survey units on the upper ends of the reservoir basins where only the lower elevations fall within the floodpools, the survey crews routinely examined canyon rims, high bedrock benches and other elevated landforms above the floodpool level. The official reservoir survey acreage, that is the acreage below the floodpools and within sample survey units, is 4004 acres (Table 5). However, an estimated 6500 acres was actually surveyed. Of the 91 prehistoric sites and 72 localities recorded by the survey, 27 sites and 5 localities are within sample survey units but are above the floodpool; 25 sites and 11 localities do not fall within a sample survey unit.

The phenomena recorded by the survey crews were classified as either sites or localities. A site is defined as any occurrence of cultural material. No minimum concentration threshold was employed, and isolated finds were recorded as sites. A standard site record form was completed for each site; a sample of this form is included in Appendix IV. In addition to the completion of the textual elements of the form, a scaled compass and pace map was prepared for most sites. Elements depicted include the physiographic location of the site, its boundaries, and any observed tools, cultural features or artifact concentrations. Maps were not prepared for isolated finds or severely disturbed sites. A schematic profile was drawn at each site to show its location within the valley profile (c.f., Fig. 2).

At the inception of the project, the plans were to collect no artifacts other than aboriginal ceramics as a matter of course. However, it became clear during the prefield investigations that artifact-collecting by local residents is a serious source of site disturbance in the project area. The collectors concentrate on chipped stone tools, especially projectile points. Chipped stone tools were therefore collected on a routine basis throughout the course of the survey as a preservation measure.

A locality is defined in this study as any noncultural, spatially discrete phenomenon in the natural environment deemed to be of potential significance to an archeological interpretation of the project area. Such phenomena as gravel outcrops, springs and fluvial terrace profiles were recorded as localities. No standard form was employed in the documentation of localities, but the following information was recorded for each: designation, location, USGS 7.5' map plotting, UTM coordinates, survey unit association, elevation, dimensions and a description of the phenomenon recorded.

Separate series of trinomial numbers were assigned to sites and localities; these were coordinated with TARL in Austin. Locality designations are prefixed with an upper case "L" (e.g., L41SN2) to distinguish them from trinomial designations for archeological sites.

In addition to the documentation described above, each survey crew maintained separate logs to describe the subject matter and location of

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each black-and-white photograph or color slide exposed. The crew chiefs submitted daily progress reports to the Project Archeologist; these were made on a standard form, and an example of it is included in Appendix IV. A narrative daily journal was maintained by the Project Archeologist. This journal describes the areas covered and the sites and localities recorded each day and contains notations of any unusual or otherwise important observations of the day.

### SPECIAL STUDIES

Four special consultants were employed by the project to provide data complementary to that of the archeological survey. An historian, Martha Doty Freeman, conducted archival research, interviewed local informants, and inspected historic sites recorded by the survey or reported by informants in order to develop an assessment of the historic cultural resources of the project area. Her research methods and the results of her investigations are presented in Part 2 of this report.

Three environmental consultants were retained for the project: Vance T. Holliday, Quaternary geologist and geomorphologist; Leroy E. Werchan, soils specialist; and Ray D. Kenmotsu, botanist. Messrs. Holliday and Kenmotsu each have considerable professional experience as archeologists.

Mr. Holliday concentrated upon those facets of the project area geology pertinent to the cultural history: the outcrop distribution of the Permian bedrock units; the age and genesis of the presently visible landforms; the distribution and relative ages of the Quaternary alluvial deposits along the major streams; and the availability of material suitable for stone tool manufacture. A general field reconnaissance of the three reservoir basins in the company of the Project Archeologist was supplemented by a review of the published literature on the geology of the region and consultation of the available soil surveys, topographic maps and 1:24 000-scale panchromatic airphotos. The results of Mr. Holliday's investigations are reported in Appendix V.

No published soil survey is available for King County, and no Soil Conservation Service soils mapping is available for those parts of the Dam Site 14 and Dam Site 19 basins which lie within that county. The investigations of Mr. Werchan were therefore concentrated on the provision of detailed soils mapping and soil unit descriptions for the King County portions of the project area. Detailed analysis of 1:24 000-scale topographic maps and panchromatic airphotos and 1:63 000-scale false color infrared imagery was supplemented by an intensive field reconnaissance to produce the requisite data. These are presented in Appendix VI.

It was clear from the inception of the fieldwork that the vegetation of the project area has been severely disturbed by overgrazing and other recent land-use practices, and that it is no longer possible to reconstruct natural floral microenvironments within the area. Therefore, Mr. Kenmotsu focused upon a review of the relevant botanical

literature in order to place the project within a regional context. Limited reconnaissance of the three reservoir basins was conducted in the company of the Project Archeologist. This was sufficient to permit an assessment of the character of the local flora and the severity of its disturbance. The results of Mr. Kenmotsu's research are reported in Appendix VII.

#### SUMMARY OF THE SURVEY RESULTS

The aboriginal sites recorded by the 1973 SMU reconnaissance and the 1981 Prewitt and Associates, Inc. partial survey of the project area, the aboriginal artifacts collected from or observed in the area by both investigations, and the localities recorded by our survey are described in a summary fashion. The following treatment of the data is intended to familiarize the reader with their salient characteristics and major trends. Detailed descriptions of the recorded aboriginal sites and localities are presented in Appendices I and II, and Appendix III provides a detailed analysis of the chipped stone tools collected during the present survey. The locations of the recorded sites and localities (including those of the historic sites treated in Part 2 of this report) are illustrated in Figures 9 through 11, and Figures 12 and 13 illustrate representative examples of the aboriginal sites, cultural features, and localities in the project area. No subsurface testing was done during this survey.

#### ABORIGINAL SITES

##### INTRODUCTION

A total of 121 aboriginal sites was recorded in the project area by the 1973 Southern Methodist University (SMU) reconnaissance (30) and the 1981 Prewitt and Associates, Inc. sample survey (91) (Table 6). The combined site sample is summarily described here in terms of site density, site types, landform and soils associations, and prevailing site condition. Few chronological diagnostics were recovered, and a discussion of the sites so classifiable is deferred to the Interpretations and Conclusions section of the report.

Only 43 of the recorded aboriginal sites lie within the 4004 acres of reservoir basin and 5.49 miles of pipeline easement which comprise the official survey sample of the present study. The remaining 78 sites were recorded during the survey while ranging above the reservoir boundaries, traveling between the survey units comprising the sample and in other incidental ways, or were recorded by the SMU reconnaissance. For purposes of an assessment of site density, only the sites within the 122 survey units of the sample are considered. Succeeding discussions of site types, landform associations, and so forth include the data from the full suite of recorded aboriginal sites within the project area.

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TABLE 6  
PROJECT AREA SUBDIVISION ASSOCIATIONS  
OF RECORDED ABORIGINAL SITES

| Subdivision | Number | Percent |
|-------------|--------|---------|
| Dam Site 10 | 39     | 32.2    |
| Dam Site 14 | 15     | 12.4    |
| Dam Site 19 | 60     | 49.6    |
| Pipeline    | 7      | 5.8     |
| TOTAL       | 121    | 100.0   |

### SITE DENSITY

#### Reservoir Basins

Aboriginal site density within the three reservoir basins is addressed from two perspectives. Tables 7 through 9 calculate site density strictly on the basis of the acreage surveyed and the sites recorded inside (1) the 102 survey units of the official survey sample, and (2) the reservoir basin boundaries. Any sites which may have been recorded outside those survey units, or within them but above the elevation of the floodpool, are not considered.

The 4004 acres surveyed within the areas so defined resulted in the recording of 39 aboriginal sites at an overall density of one site per 103 acres. The site density of Stratum A, incorporating the mainstems of the three reservoir basins, is one site per 124 acres, and that for Stratum B, the tributary valleys, is one site per 83 acres. If the two strata are combined, the site density for the Dam Site 10 basin is one site per 184 acres, that for the Dam Site 14 basin is one site per 72 acres, and that for the Dam Site 19 basin is one site per 94 acres. On the basis of this information, one would conclude that (1) the mean site density of the reservoir basin areas is roughly one site per 100 acres, (2) the site density along the smaller tributary valleys is substantially higher than that of the mainstem valleys of Croton, Short Croton and North Croton creeks, and (3) there appear to be substantial variations in site density between the three reservoir basins.

As Table 10 illustrates, there were nearly as many sites recorded along the margins of, but outside, the reservoir boundaries in the survey units comprising the official survey sample (27) as were recorded in those units inside the reservoir boundaries (39). Over half (16) of these marginal sites were recorded in the Dam Site 10 basin area.

Figure 9

# BRAZOS NATURAL SALT POLLUTION PROJECT

## DAM SITE 10

### KNOWN ARCHEOLOGICAL SITES & LOCALITIES

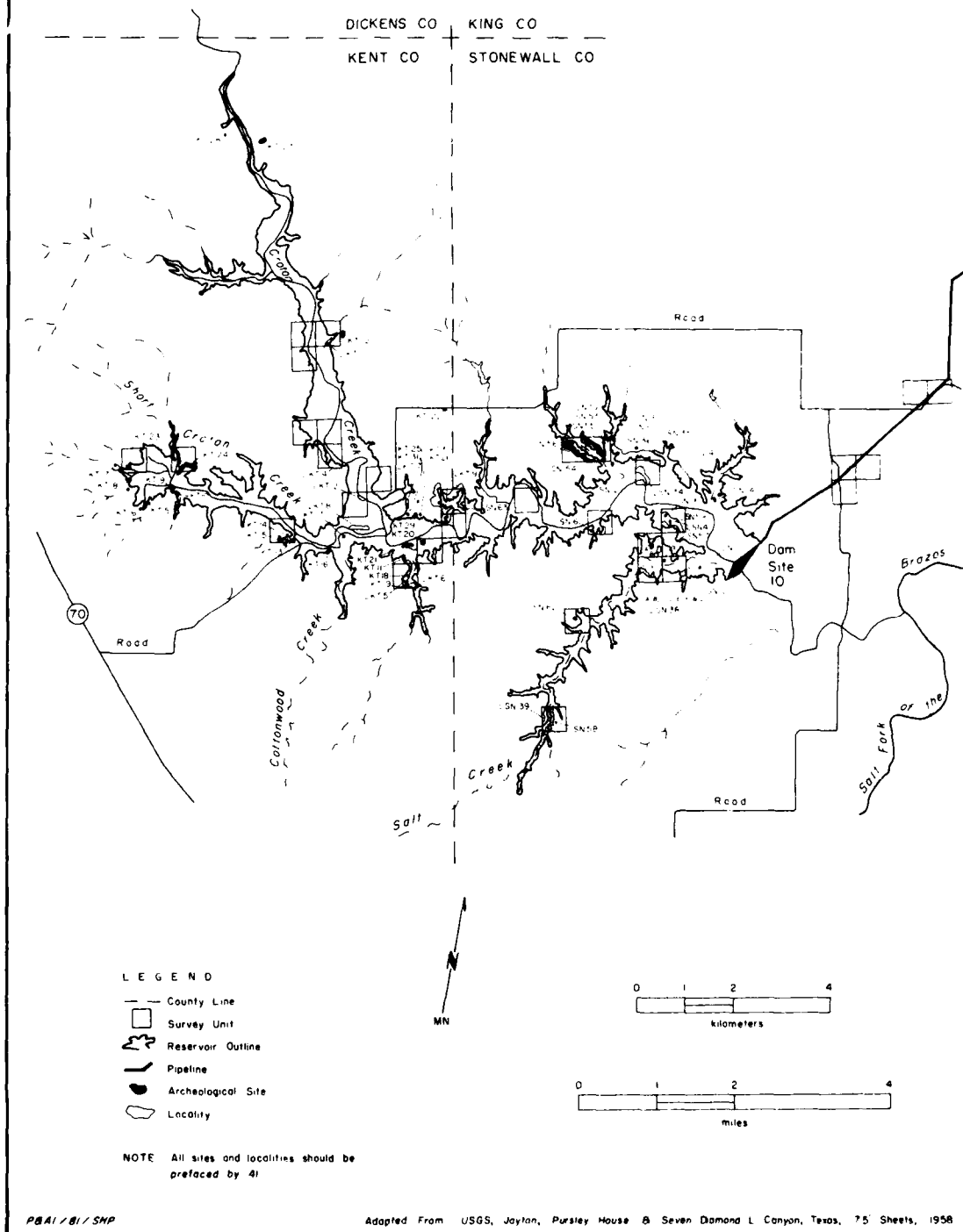
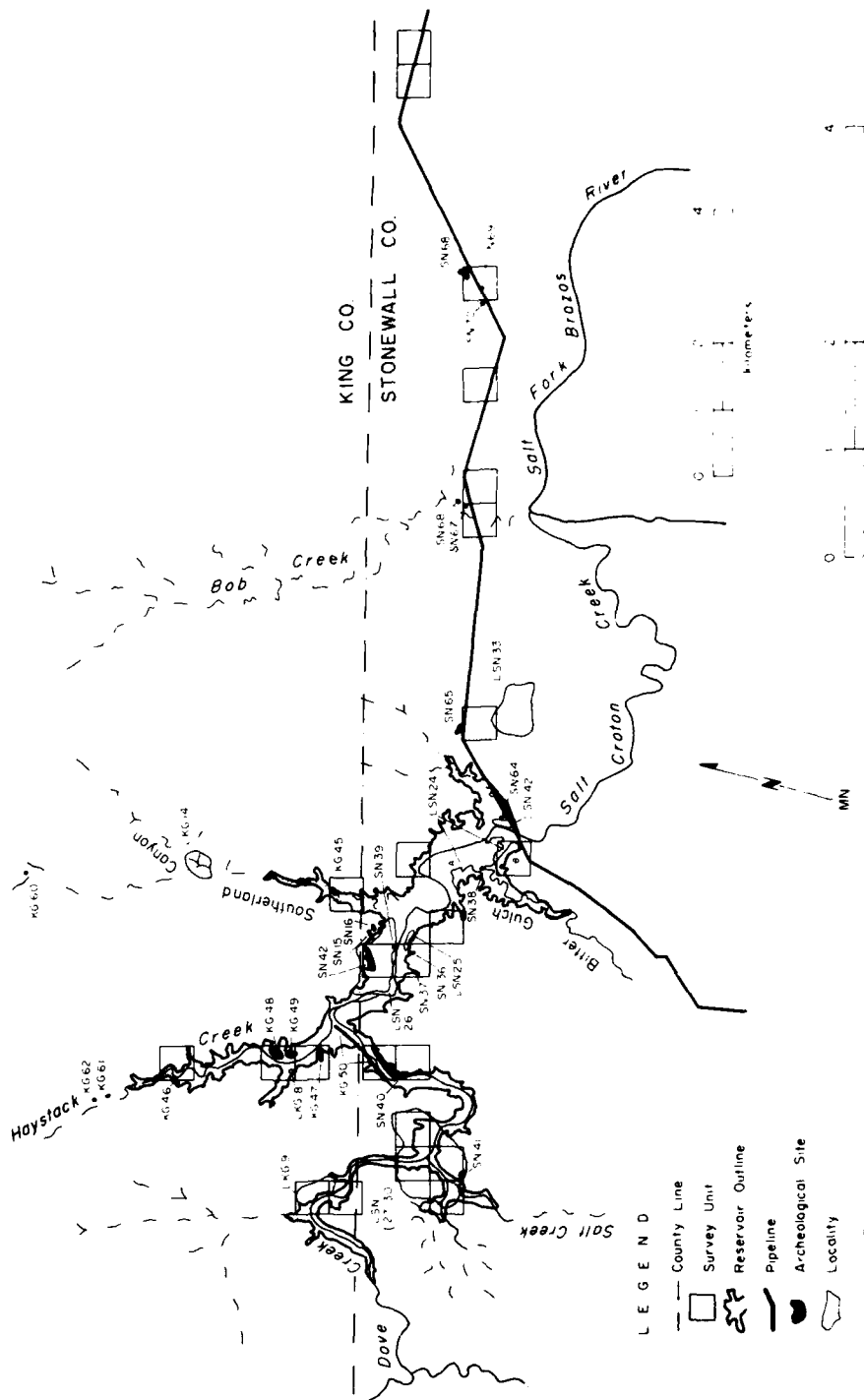




Figure 10

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 14 KNOWN ARCHEOLOGICAL SITES & LOCALITIES



Adapted From USGS, Bob Creek, Lovers Resort, Seven Diamond L. B. Southerland Canyon, Texas, 75 Sheets, 1958

PA 41/BI/SHP

**BRAZOS NATURAL SALT POLLUTION PROJECT**  
**DAM SITE 19**  
**KNOWN ARCHEOLOGICAL SITES & LOCALITIES**



PART 1: PREHISTORIC RESOURCES

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Figure 12. Aboriginal Sites and Localities.

a. View north-northeast from site 41KT19, atop a bedrock bench overlooking Panther Creek in the Dam Site 10 area. The site is a discrete concentration of cultural material within a much larger lag concentration of stream-rolled gravels, recorded as locality L41KT5. Note the numerous pebbles and cobbles directly atop the bedrock.

b. Facing west up Wedington Creek in the Dam Site 19 area. Site 41SN46 stretches continuously along the canyon rim at the right-hand edge of the photo. A recent point bar enters from the left.

c. Locality L41KG8, facing east-northeast, a brine spring which discharges into Haystack Creek (background) in the Dam Site 14 area. The spring discharges at the feet of the surveyor standing right of center.

d. View facing north up a spring-fed tributary of North Croton Creek in the western Dam Site 19 area, on the boundary between Survey Units B-75 and B-76. The water in the pool is slightly gypsiferous but relatively fresh. Crayfish were observed in the pool. Note the cat-tails in the foreground. Sites 41KG51 and 41KG52 are immediately adjacent on bedrock benches overlooking the stream.

Figure 12



*a*



*b*



*c*



*d*

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Figure 13. Aboriginal Features.

a. Site 41SN27, view east of Feature 5, a concentration of burned quartzite and sandstone, lithic debitage and bone and shell fragments, presumably the remains of an aboriginal rock-lined hearth. Use of stream-rolled cobbles for hearthstones is characteristic of the area. Scale in decimeters; the feature measured 85 centimeters north-south by 90 centimeters east-west at the time of this photo.

b. View west of the same feature one week later, after heavy rains. The density of visible cultural material was increased, and the feature was enlarged to a diameter of approximately 1 meter. Erosional processes can proceed at a very rapid rate in the project area.

c. Site 41SN34, view east of Feature 1, a concentration of burned quartzite and dolomite measuring 60 centimeters north-south by 44 centimeters east-west, again presumed to represent a rock-lined hearth.

d. Site 41KT21, view southwest of Feature 1, a concentration of burned dolomite and quartzite and lithic debitage, measuring 50 centimeters north-south by 100 centimeters east-west. Tabular dolomite like that dominating this feature was used much less frequently than quartzite in aboriginal features.

Figure 13



*a*



*b*



*c*



*d*

TABLE 7  
ABORIGINAL SITE DENSITY: STRATUM A<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 2                 | 586                 | 1/293                        |
| Dam Site 14     | 3                 | 216                 | 1/72                         |
| Dam Site 19     | <u>14</u>         | <u>1551</u>         | <u>1/111</u>                 |
| TOTAL           | 19                | 2353                | 1/124                        |

TABLE 8  
ABORIGINAL SITE DENSITY: STRATUM B<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 3                 | 334                 | 1/111                        |
| Dam Site 14     | 2                 | 146                 | 1/73                         |
| Dam Site 19     | <u>15</u>         | <u>1171</u>         | <u>1/78</u>                  |
| TOTAL           | 20                | 1651                | 1/83                         |

TABLE 9  
ABORIGINAL SITE DENSITY: STRATA A AND B<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 5                 | 920                 | 1/184                        |
| Dam Site 14     | 5                 | 362                 | 1/72                         |
| Dam Site 19     | <u>29</u>         | <u>2722</u>         | <u>1/94</u>                  |
| TOTAL           | 39                | 4004                | 1/103                        |

<sup>1</sup> Calculations include only sites and acreage within official sample survey units, inside reservoir basins.

<sup>2</sup> Site/Acres.

TABLE 10  
CROSS-TABULATION OF ABORIGINAL SITES WITHIN OFFICIAL SAMPLE  
SURVEY UNITS, INCLUDING SITES ON RESERVOIR BASIN MARGINS<sup>1</sup>

| Reservoir Basin | Stratum A           |                           | Stratum B           |                           | TOTAL |
|-----------------|---------------------|---------------------------|---------------------|---------------------------|-------|
|                 | Inside <sup>2</sup> | Margin <sup>3</sup> Total | Inside <sup>2</sup> | Margin <sup>3</sup> Total |       |
| Dam Site 10     | 2                   | 2 4                       | 3                   | 14 17                     | 21    |
| Dam Site 14     | 3                   | 3 6                       | 2                   | 4 6                       | 12    |
| Dam Site 19     | 14                  | 1 15                      | 15                  | 3 18                      | 33    |
| TOTAL           | 19                  | 6 25                      | 20                  | 21 41                     | 66    |

<sup>1</sup> Includes only sites within official sample survey units.

<sup>2</sup> Sites within reservoir basin.

<sup>3</sup> Sites at reservoir basin margin.



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One should recall that, in calculating the acreage of each survey unit for purposes of selecting the official survey sample, only the acreage within the reservoir basin boundary was included. Thus, although a complete 500x500-meter survey unit contains 62 acres, many of the units along the reservoir margins contained less than 62 acres of reservoir basin area and were counted as partial units. The mean effective area so defined of the 102 survey units comprising the reservoir basin sample is only 40 acres per unit.

Tables 11 through 13 recalculate the site density of the reservoir basin areas by expanding the data base to include (1) the 27 sites marginal to the reservoir basin but within the 102 survey units of the official sample survey, and (2) the entire 62 acres of each of those survey units. By doing so, the relevant site sample is increased from 39 to 66 (Table 13), and the relevant acreage sample from 4004 to 6324.

It is significant that the overall site density is not substantially different, at one site per 96 acres, from that originally calculated. The data still indicate a site density along the tributary valleys which is nearly twice as high as that along the mainstem valleys. But, as Table 14 illustrates, calculations based on the enlarged sample eliminate most of the apparent differences in site density between the three reservoir basins. In particular, the estimated site density of the Dam Site 10 basin is doubled. This change is not difficult to explain. The elevation of the Dam Site 10 floodpool as planned falls below the canyon rims and upper bedrock benches of much of the reservoir basin area. As the subsequent discussion of landform associations demonstrates, the upper valley landforms are areas of relatively high site density.

In summary, three primary conclusions can be reached regarding aboriginal site density in the reservoir basin areas on the basis of the presently available data: (1) the mean site density is approximately one site per 100 acres; (2) site density is significantly higher along the tributary stream valleys than within the mainstem valleys; and (3) there are no major differences in site density among the three reservoir basins.

### Pipeline Easement

The survey sample of 5.49 miles of the total proposed 21.8 miles of pipeline easement revealed four sites which fall within the easement. This is a site density of one site per 1.37 miles. An additional three sites were recorded during the course of the pipeline survey which do not fall within the easement.

### Site Types

The range of variation in site types recorded to date within the project area is illustrated in Table 15. The dominant site form (91, or 81.0 percent of the 121 sites) is an open scatter of lithic devitage and burned rocks which are associated with infrequent chipped stone and ground stone tools. Site area tends to be small, generally under 1000 m<sup>2</sup>, and artifact densities within sites are generally quite low.

TABLE 11  
ABORIGINAL SITE DENSITY BASED ON EXPANDED  
SURVEY SAMPLE: STRATUM A<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 4                 | 868                 | 1/217                        |
| Dam Site 14     | 6                 | 620                 | 1/103                        |
| Dam Site 19     | <u>15</u>         | <u>1736</u>         | <u>1/116</u>                 |
| TOTAL           | 25                | 3224                | 1/129                        |

TABLE 12  
ABORIGINAL SITE DENSITY BASED ON EXPANDED  
SURVEY SAMPLE: STRATUM B<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 17                | 744                 | 1/44                         |
| Dam Site 14     | 6                 | 372                 | 1/62                         |
| Dam Site 19     | <u>18</u>         | <u>1984</u>         | <u>1/110</u>                 |
| TOTAL           | 41                | 3100                | 1/76                         |

<sup>1</sup>Calculations include all sites and acreage within official sample survey units, both inside and above reservoir basins.

<sup>2</sup>Site/Acres.

TABLE 13  
ABORIGINAL SITE DENSITY BASED ON EXPANDED  
SURVEY SAMPLE: STRATA A AND B<sup>1</sup>

| Reservoir Basin | Sites<br>Recorded | Acreage<br>Surveyed | Site<br>Density <sup>2</sup> |
|-----------------|-------------------|---------------------|------------------------------|
| Dam Site 10     | 21                | 1612                | 1/77                         |
| Dam Site 14     | 12                | 992                 | 1/83                         |
| Dam Site 19     | <u>33</u>         | <u>3720</u>         | <u>1/113</u>                 |
| TOTAL           | 66                | 6324                | 1/96                         |

TABLE 14  
COMPARISON OF ABORIGINAL SITE DENSITY  
ESTIMATES: STRATA A AND B<sup>1</sup>

| Reservoir Basin | Official Sample <sup>2</sup> | Expanded Sample <sup>2</sup> |
|-----------------|------------------------------|------------------------------|
| Dam Site 10     | 1/184                        | 1/77                         |
| Dam Site 14     | 1/72                         | 1/83                         |
| Dam Site 19     | <u>1/94</u>                  | <u>1/113</u>                 |
| TOTAL           | 1/103                        | 1/96                         |

<sup>1</sup>Calculations include all sites and acreage within official sample survey units, both inside and above reservoir basins.

<sup>2</sup>Site/Acres.

TABLE 15  
RELATIVE FREQUENCIES OF ABORIGINAL SITE TYPES

| Site Type                                  | No.      | %          |
|--|----------|------------|
| Large, dense lithic scatter <sup>1</sup>   | 7        | 5.8        |
| Large, diffuse lithic scatter              | 35       | 28.9       |
| Small, dense lithic scatter                | 5        | 4.1        |
| Small, diffuse lithic scatter              | 51       | 42.1       |
| Isolated hearth                            | 9        | 7.4        |
| Isolated artifact                          | 5        | 4.1        |
| Lithic procurement area                    | 4        | 3.4        |
| Redeposited cultural material <sup>2</sup> | 2        | 1.7        |
| Undetermined <sup>3</sup>                  | <u>3</u> | <u>2.5</u> |
| TOTAL                                      | 121      | 100.0      |

<sup>1</sup>"Large" sites cover an area of 1000 m<sup>2</sup> or more; "Small" sites occupy less than 1000 m<sup>2</sup>. Artifact density classes ("Dense" and "Diffuse") are based on subjective field assessments.

<sup>2</sup>Sites 41KG50 and 41SN40. See text and Appendix I.

<sup>3</sup>Sites 41SN15, 41SN16 and 41SN43. See text and Appendix I.

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Concentrations of heat-fractured rock, generally 30 to 50 centimeters in diameter and circular to somewhat oval in plan, are frequently observed within the aboriginal sites, and probably represent rock-lined hearths. These features also commonly contain several specimens of unburned lithic debitage and/or ground stone tools and tool fragments.

Several of the burned dolomite features are surprisingly large and contain much more material than one would expect to see in a single hearth. The best example of such a feature, recorded as site 41SN47, measures 2.5 by 4 meters and contains hundreds of burned dolomite fragments. These features are reminiscent of the smaller examples of burned rock middens common to Central Texas.

The number of discernible features at a given site varies widely. No features were observed at 70 of the 98 lithic scatters, or 71.4 percent. Between one and five features were observed at 20 (20.4 percent) of these sites, and more than five features at only eight (8.2 percent) sites. As many as 24 presumed hearths have been observed at a single site (41SN34). All of the sites with more than five features are larger than 1000 m<sup>2</sup>, and half of the sites with one to five features fall within that size range. Post-occupational disturbance undoubtedly plays a major role in apparent feature frequency; rarely is an aboriginal site devoid of burned rock, yet only 28.6 percent of the lithic scatters contained discernible features. It seems likely that hearths were present at most or all of the lithic scatters at one time, and many of the very small sites may represent nothing more than the severely disturbed remains of one or two hearths.

The remaining 19.0 percent (23) of the 121 recorded aboriginal sites is classifiable within relatively few categories. Nine sites are isolated cultural features of the type described above, presumed to be hearths, with very little associated occupational debris. Five sites are isolated finds which consist of single chipped stone artifacts. Four lithic procurement areas were identified (c.f., 41SN55) in association with dense lag concentrations of stream-rolled gravels in the high strath terraces along the mainstems of the reservoir basins. The sites contain little or no burned rock but exhibit a high density of lithic debitage dominated by tested cobbles, cores and corticate flakes. It should be noted that such areas were recorded as sites only if a high density of debitage was observed. Many of the 34 gravel exposures recorded as localities were associated with extremely diffuse scatters of lithic debitage. One of the lithic procurement areas, site 41SN42, is a concentration of lithic debitage within a much larger exposure of gravels recorded as a locality (L41SN26).

Two of the recorded sites, 41KG50 and 41SN40, might have been more appropriately documented as localities. The cultural materials of the sites were found eroding from the bases of two remnants of the 1-to-3-meter terrace along Salt Croton Creek. Articulated skeletal material of modern domesticated cattle was observed to be eroding from the base of this terrace. It is virtually certain that this lowest Salt Croton Creek terrace is of very recent age, probably dating within the past century or two (Appendix V). It is assumed that the cultural materials

which comprise sites 41KG50 and 41SN40 derive from sites which have been destroyed by erosion and subsequently have been transported to the present locations by a combination of alluvial and colluvial erosional/depositional processes.

Three sites are of undetermined type. Sites 41SN15 and 41SN16 were recorded by SMU in 1973 and were not revisited by the present survey. The rather meager documentation suggests large lithic scatters associated with numerous relatively intact features, but reassessment of the sites in the field will be necessary. Site 41SN43, recorded in following up a lead provided by a local informant, appears to be a Paleoindian component associated with Pleistocene faunal material and a large quantity of burned rock which was exposed during the excavation of a stock tank. The site is known only from informant reports and the material appearing on spoil banks; it cannot be further assessed at this time.

#### Landform Associations

Table 16 summarizes the frequency of occurrence of aboriginal sites in association with specific landforms. By far the highest site density occurs on canyon rims and bedrock benches; these two classes combined account for 75.3 percent of the 121 recorded aboriginal sites. The valley margin slopes and alluvial terrace categories are of roughly equivalent, if secondary, importance. Only five sites were recorded on upland slopes, but it should be recalled that the survey concentrated on reservoir basins, and the upland landforms are almost certainly under-represented in the survey sample.

TABLE 16  
LANDFORM ASSOCIATIONS OF ABORIGINAL SITES

| Landform            | Number    | Percent    |
|---------------------|-----------|------------|
| Upland slope        | 5         | 4.1        |
| Canyon rim          | 40        | 33.1       |
| Valley margin slope | 13        | 10.7       |
| Bedrock bench       | 51        | 42.2       |
| Alluvial terrace    | <u>12</u> | <u>9.9</u> |
| TOTAL               | 121       | 100.0      |

Within the stream valleys, sites tend to occur high in the valley profile; the mean height above present stream level of the aboriginal sites is 13 meters. Along similar lines, no sites were recorded on the modern floodplain, and only 12 sites (9.9 percent) were found on alluvial terraces which tend to occur at lower elevations within the

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valleys. These trends undoubtedly reflect the instability of the streams in that the streams probably have buried or destroyed many of the earlier aboriginal sites which once may have occupied the lower elevations (see Appendix V). This is particularly true of North Croton Creek which exhibits the least terrace development of the three reservoir basin mainstems.

Table 17 further subdivides the 12 terrace sites by apparent age of terrace fill; the tabulation follows the interpretations presented in Appendix V. It is assumed that sites occurring atop these landforms postdate the inferred age of the deposit. For example, the four sites recorded on late Pleistocene terraces (41SN15, 41SN16, 41SN18 and 41SN42) are presumably of early Archaic or later age. Sites on mid to early Holocene-age terraces may date no earlier than early or middle Archaic times (41KT12 and 41KT16). It is presumed that sites on late Holocene terraces are no earlier than the late Archaic (41KT17, 41SN38, 41SN39 and 41SN64). The two sites recorded on recent terraces, 41KG50 and 41SN40, are the two redeposited sites treated in the discussion of site types.

TABLE 17  
ALLUVIAL TERRACE ASSOCIATIONS OF ABORIGINAL SITES

| Terrace Age           | Number   | Percent     |
|-----------------------|----------|-------------|
| Late Pleistocene      | 4        | 33.3        |
| Mid to early Holocene | 2        | 16.7        |
| Late Holocene         | 4        | 33.3        |
| Modern <sup>1</sup>   | <u>2</u> | <u>16.7</u> |
| TOTAL                 | 12       | 100.0       |

<sup>1</sup> Redeposited cultural material; sites 41KG50 and 41SN40. See text and Appendix I.

### Soils Associations and Site Condition

The predominant soils associations of the aboriginal sites provide an informative index of the integrity of context of their cultural deposits. Table 18 quantifies the frequency of occurrence of sites on soils of the relevant Soil Conservation Service (SCS) subgroups (Soil Survey Staff 1975), and Table 19 summarizes our field assessments of site condition.

These data show that 77.7 percent of the sites occur on Entisols or Inceptisols of Lithic subgroups in which bedrock lies within 50 centimeters of the surface. Over 85 percent of the sites are classified as

TABLE 18  
SOILS ASSOCIATIONS OF ABORIGINAL SITES

| SCS Subgroup <sup>1</sup> | Number   | Percent    |
|---------------------------|----------|------------|
| Typic Paleustoll          | 1        | .8         |
| Typic Ustochrept          | 8        | 6.6        |
| Lithic Ustochrept         | 6        | 5.0        |
| Fluventic Ustochrept      | 2        | 1.7        |
| Ustic Torripsamment       | 1        | .8         |
| Typic Ustorthent          | 5        | 4.1        |
| Lithic Ustorthent         | 19       | 15.7       |
| Typic Torriorthent        | 7        | 5.8        |
| Lithic Torriorthent       | 69       | 57.0       |
| Typic Ustifluvent         | <u>3</u> | <u>2.5</u> |
| TOTAL                     | 121      | 100.0      |

<sup>1</sup> Following the Soil Conservation Service (SCS) Seventh Approximation (Soil Survey Staff 1975).

TABLE 19  
SUMMARY OF ABORIGINAL SITE CONDITION

| Condition <sup>1</sup> | Number     | Percent     |
|------------------------|------------|-------------|
| Slightly disturbed     | 1          | .8          |
| Moderately disturbed   | 17         | 14.0        |
| Severely disturbed     | <u>103</u> | <u>85.2</u> |
| TOTAL                  | 121        | 100.0       |

<sup>1</sup> Based on subjective field assessment.



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severely disturbed. This indicates that the cultural deposits appear to be largely or entirely deflated by erosion, and have suffered moderate to severe lateral displacement and mixing of cultural material.

The two trends are genetically related. The Orthents and Ochrepts with which the sites are primarily associated occur on bedrock benches, canyon rims and valley margin slopes which are being deflated by sheet and rill erosion with sufficient rapidity to effectively retard the formation of soil horizons. It is hardly surprising that cultural deposits occurring in such an unstable context should generally be deflated and mixed. Further, it seems very likely that many aboriginal sites (particularly earlier ones) have been completely destroyed in the severely unstable badland areas of exposed bedrock which are completely devoid of even the shallow A horizon associated with an Orthent.

### Summary

A total of 121 aboriginal sites has been recorded to date within the Brazos Natural Salt Pollution Control Project area, but only 43 of those sites lie within the 4004 acres of reservoir basin area and 5.49 miles of pipeline easement comprising the official survey sample of the present study. The mean site density within the reservoir basin areas is estimated at approximately one site per 100 acres, and that along the pipeline easement at one site per 1.37 miles. Site density is markedly higher along tributary canyons and valleys than along the mainstem valleys of Croton, Salt Croton and North Croton creeks. There are no marked differences in site density between the three reservoir basins.

The most commonly encountered type of aboriginal site is an open, relatively diffuse, unpatterned scatter of chipped and ground stone tools, chipped stone debitage and burned rock which generally extends over less than 1000 square meters. The only recognized cultural features at these sites are concentrations of burned rock which usually appear to be the remains of small, rock-lined hearths, but which resemble small burned rock middens in a few instances. A small number of isolated hearths, isolated artifacts and lithic procurement areas were also recorded as sites.

Three-fourths of the recorded aboriginal sites are located on canyon rims and bedrock benches along the stream valleys. Roughly 20 percent were found on alluvial terraces and valley margin slopes, and the remaining 5 percent on upland slopes. It is likely that the upland landforms are under-represented due to the concentration of the survey on stream valleys. Nearly 80 percent of the sites occur on rapidly eroding soils, where bedrock is within 50 centimeters of the surface, and have been severely disturbed by erosion. The typical site within the project area is largely or entirely deflated, and has suffered serious lateral redistribution of its contents.

## ABORIGINAL ARTIFACTS

## INTRODUCTION

Sixty-three chipped stone tools were collected during the present survey. A detailed analysis of that collection is provided in Appendix III; the reader is referred to that appendix for definitions of the various tool classes, illustrations of representative examples of each class, and provenience data. Table 20 summarizes the relative frequencies of different raw material types in the chipped stone tool collection.

The specimens relevant to a chronological interpretation of the sites are identified in Table 21. No artifacts were collected during the 1973 SMU reconnaissance of the project area, but the chronological diagnostics observed during the course of those field investigations are included in Table 21.

In the discussion which follows, the character of the chipped stone tools collected by the present survey is summarized first, then the range in variation of the aboriginal artifacts observed in the field, but not collected by our survey is briefly noted.

## COLLECTED CHIPPED STONE TOOLS

The collection is dominated by projectile points, other small, reasonably well-made bifaces, planoconvex unifaces and rather simple flake tools. Within the projectile points, dart points are more common than arrow points at a ratio of 7:1. The most common dart point form exhibits an expanding stem and a broad, strongly barbed, alternately beveled blade. The other bifaces tend to be of ovaloid or subrectangular outline, are reasonably well thinned, and tend to be moderately small with an average of about 4 centimeters length. Edge angles and character of use wear within the finished (Group 3) bifaces are quite variable. This suggests that the tools were designed to serve a variety of functions.

The planoconvex unifaces fall into two categories: those which exhibit retouch only on one or both lateral edges, and those which also exhibit retouch of the distal edge. Such tools have traditionally been referred to as "side scrapers" and "end scrapers," respectively. The distally retouched specimens tend to be wedge-shaped in longitudinal cross section with nearly vertical distal edge angles. As a group, the planoconvex unifaces exhibit markedly steeper edge angles than the bifacial tools. Utilized edges tend to exhibit either intense, minute shattering or a heavy polish.

The simpler flake tools are evenly divided between those which exhibit some deliberate edge preparation through pressure retouch and those which appear to have been used with no preparatory edge modification. The specimens are variable in shape and size, but as a group tend

TABLE 20  
CHIPPED STONE TOOL RAW MATERIAL FREQUENCIES

| Material                   | Artifact Classes |            |               |                     |                 |                    |                   |              |
|----------------------------|------------------|------------|---------------|---------------------|-----------------|--------------------|-------------------|--------------|
|                            | Arrow Point      | Dart Point | Other Bifaces | Planoconvex Uniface | Retouched Flake | Edge-damaged Flake | Possible Gunflint | TOTAL NUMBER |
| Fusulinid Chert            | 2                | 10         | 7             | 3                   | 5               | 2                  | -                 | 29           |
| Aphanitic Chert            | -                | 1          | 2             | 3                   | 1               | 3                  | 1                 | 11           |
| Tecovas Jasper             | -                | 1          | -             | -                   | -               | 1                  | -                 | 2            |
| Other Jasper               | -                | -          | -             | -                   | 1               | -                  | -                 | 1            |
| Ogallala Quartzite         | -                | -          | 5             | 1                   | 1               | -                  | -                 | 7            |
| Other Quartzite            | -                | -          | 2             | 3                   | -               | -                  | -                 | 5            |
| Silicified Wood            | -                | 1          | 2             | -                   | 1               | 2                  | -                 | 6            |
| Alibates Agatized Dolomite | -                | 1          | -             | -                   | -               | -                  | -                 | 1            |
| Metamorphosed Siltstone    | -                | -          | -             | 1                   | -               | -                  | -                 | 1            |
| TOTAL                      | 2                | 14         | 18            | 11                  | 9               | 8                  | 1                 | 63           |

TABLE 21  
PROVENIENCE SUMMARY OF OBSERVED AND COLLECTED  
CHRONOLOGICAL DIAGNOSTICS

| Class             | Site   | Presumed Age <sup>1</sup> |
|-------------------|--------|---------------------------|
| Possible Gunflint | 41KT24 | Historic                  |
| Arrow Point       |        |                           |
| Cuney             | 41SN57 | Late Prehistoric          |
| Harrell           | 41SN16 | Late Prehistoric          |
| Huffaker          | 41SN34 | Late Prehistoric          |
| Scallorn          | 41SN16 | Late Prehistoric          |
| Unclassified      | 41KG27 | Late Prehistoric          |
| Dart Point        |        |                           |
| Castroville       | 41SN50 | Late Archaic              |
| Edgewood          | 41KG58 | Late Archaic              |
| Ensor             | 41SN55 | Late Archaic              |
| Trinity           | 41SN45 | Late Archaic              |
| Marshall          | 41KG49 | Middle to late Archaic    |
| Nolan             | 41KG40 | Middle Archaic            |
| Gower             | 41KG59 | Early Archaic             |
| Martindale        | 41SN62 | Early Archaic             |
| Unclassified      | 41KT7  | Archaic                   |
| Unclassified      | 41KG25 | Archaic                   |
| Unclassified      | 41KG52 | Archaic                   |
| Unclassified      | 41KG54 | Archaic                   |
| Unclassified      | 41SN6  | Archaic                   |
| Unclassified      | 41SN29 | Archaic                   |
| Unclassified      | 41SN34 | Archaic                   |
| Unclassified      | 41SN35 | Archaic                   |
| Unclassified      | 41SN54 | Archaic                   |
| Unclassified      | 41SN61 | Archaic                   |

<sup>1</sup> Following Etchieson et al. 1978:86; and Prewitt 1981.

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to be thinner than the planoconvex unifaces. Edge angles within the utilized flakes are variable, but are generally steep, and most specimens exhibit intense, minute shattering along the apices of their edges.

Two unusual tools were collected. A small biface was found at 41SN43 which has burin spalls struck from both lateral edges. Pleistocene faunal material is known from the site, and the tool may relate to a Paleoindian component. A small uniface fragment collected from site 41KT24 exhibits the rectangular outline, steeply beveled edges and prismatic cross section characteristic of many gunflints of aboriginal manufacture (c.f., Blaine and Harris 1967:Fig. 41c; Good 1972:Fig. 29; Harris et al. 1965:Fig. 17a-j; Tunnell and Newcomb 1969:Figs. 62 and 63). However, given the fragmentary nature of the specimen, the identification as a gunflint must certainly be considered tentative.

Most of the raw materials from which the chipped stone tools were manufactured (Table 20) are available in local gravel deposits. Only the specimen of Alibates agatized dolomite is clearly of exotic origin. However, marked aboriginal selectivity in lithic resource utilization is apparent in the collection. All of the more common materials composing the collected tools are very minor constituents in the gravel deposits. Cherts dominate the chipped stone tool collection; 63.5 percent of the specimens were manufactured from light to medium gray and brown fusiloid and aphanitic cherts. These materials probably account for less than 1 percent of the gravels in the project area. By contrast, only 8 percent of the collected tools were manufactured from the varied orthoquartzites and metaquartzites which dominate the local gravel deposits.

### OBSERVED ABORIGINAL ARTIFACTS

The range of variation in the aboriginal artifacts which were observed in the field but which were not collected is limited. The only tools encountered other than the collected chipped stone specimens are simple battered and/or abraded quartzite (rarely quartz or indurated sandstone) stream cobbles which were apparently used as hammerstones and abraders with no prior modification.

The most common artifactual constituent of most aboriginal sites in the project area is heat-fractured rock. Quartzite and quartz stream cobbles collected from the gravel deposits were most frequently utilized as hearthstones (and possibly as boiling stones). Dolomite, sandstone, shale and selenite are also locally common.

Finally, lithic debitage is usually present at the aboriginal sites. A subjective impression is that debitage of all stages of reduction, including cores and corticate flakes, is typically present at a given site. Local cherts, Ogallala quartzite and silicified wood dominate the debitage.

## LOCALITIES

## INTRODUCTION

Seventy-two localities were recorded during the present study. A locality is broadly defined as any spatially discrete phenomenon which is relevant to an archeological interpretation of the project area, but which cannot be appropriately recorded as a site. The recorded localities include: (1) 34 exposures of stream-rolled gravels suitable for aboriginal exploitation as lithic raw material; (2) 18 springs; (3) 7 geologically informative alluvial terrace profiles; (4) 5 possible erosional remnants of aboriginal sites; (5) 4 outcrops of copper sulphate (probably brochantite or antlerite); (6) 3 collapsed rockshelters; and (7) 1 concentration of unmodified dolomite slabs.

An additional 55 locations were recorded as "localities" during the 1973 SMU reconnaissance of the project area (Skinner 1973:Figs. 1-3). However, the definition of a locality employed by that reconnaissance was substantially different from that used in the present survey. Apparently, concentrations of cultural materials, which, on a subjective basis, were not deemed worthy of recording as sites, were classified as "localities" and were simply plotted on a map (Skinner 1973:7-8). No designations were assigned to these localities, and no documentation of their characteristics was maintained. The SMU localities have therefore not been included in this report.

## GRAVEL EXPOSURES

Dense concentrations of well-rounded alluvial gravels are ubiquitous through the project area. They are found in two geomorphological contexts: (1) in broad lag concentrations running parallel to and 12 to 24 meters above the modern streams; and (2) at the bases of headward erosion scarps along the edges of more intact, relatively recent terrace deposits at lower elevations generally 6 to 9 meters above modern stream level.

The high lag gravel concentrations have resulted from the deflation, through long-term sheet and rill erosion, of relatively ancient terrace deposits associated with the reservoir basin mainstems. Along Croton Creek these concentrations are derived from the late Pleistocene 21-to-24-meter strath terrace (L41SN35 and L41SN40) and the mid to early Holocene 12-to-18-meter fill terrace (L41KT4-6, L41KT9, L41SN34 and L41SN41). Two deposits oriented along Salt Creek, a tributary of Croton Creek, were found at elevations of 21 to 24 meters (L41SN38) and 12 meters (L41SN39), and may be coeval with the upper Croton terraces. Along Salt Croton Creek, extensive lag gravel concentrations derive from the late Pleistocene 12-meter strath terrace (L41KG9, L41SN26-30 and L41SN33). Similar concentrations are associated with the late Pleistocene 12-to-18-meter strath terrace on North Croton Creek (L41KG5, L41KG7, L41KG12, L41KG15-19, L41KG21, L41SN2, L41SN23 and L41SN31).

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Exposures of the basal gravels of lower, more recent alluvial terraces were noted in association with the late Holocene 6-to-9-meter fill terraces along Croton Creek (L41KT2 and L41KT8) and Salt Croton Creek (L41SN24, L41SN25 and L41SN42). It is likely that these exposures are of much too recent origin to have been exploited aboriginally, and in no instance was any cultural material observed in association with these exposures.

In contrast, it is clear that the higher lag concentrations were exploited by aboriginal groups as sources of lithic raw materials for use in chipped and ground stone tool manufacture, and as hearthstones and/or boiling stones. Extremely diffuse scatters of lithic procurement debitage were observed at 22, or 75.9 percent of the 29 relevant localities. Four concentrations of such debitage at a sufficient density to merit recording as lithic procurement areas were encountered at sites 41SN12, 41SN42, 41SN55 and 41SN56 (Appendix I). Gravels identical to those of the high terraces dominate the contents of aboriginal rock-lined hearths in the project area.

In composition and size range, the gravels are quite similar to the Seymour gravels of the upper Wichita River drainage basin in northern King and Knox counties as described by Hood (1978). The materials range in size from pebbles (0.5 to 6.5 centimeters in diameter) to cobbles (6.5 to 25.5 centimeters in diameter). Cobbles of 20 to 25 centimeters in diameter are quite common. Probably 75 to 80 percent of the gravels comprise a diverse suite of gray, red, brown and violet medium- to coarse-grained quartzites. These quartzites are the most durable of the materials and tend to dominate the upper end of the size range. Milky quartz is also very common, and various dolomites, sandstones, shales and gypsum may be common locally.

Present in significant, but much lesser, frequencies are various fine-grained quartzites, cherts, jaspers and silicified woods. Among the fine-grained quartzites, the most common varieties are dark violet, nearly vitreous metaquartzites and gray to brown siliceous, sandy siltstones. The latter materials are often termed "Potter chert" in the regional literature; in this report it is referred to as Ogallala quartzite. The cherts may be gray or tan and often contain fusulinid fossils. Various red, brown and yellow monocolored jaspers occur, and the mottled red, brown, yellow and violet material known as Tecovas jasper is infrequently observed. A wide variety of multicolored silicified woods is present, including silicified palm wood.

### SPRINGS

Of the 18 springs recorded during the present survey, all but one (L41KG8) are moderately to slightly gypsiferous. Thus, the majority of the springs encountered apparently discharge from the upper groundwater unit. The effluent of L41KG8 is concentrated brine characteristic of the lower unit. The spring was found in the Dam Site 14 area, just 1 meter above the elevation of the Haystack Creek salt flat, and the

toxicity of its effluent prevents any vegetal growth in its vicinity (Fig. 12c).

By contrast, the other springs were found high in the landscape and are generally associated with a dense growth of vegetation (Fig. 12d). A remarkably dense cluster of springs was recorded in Survey Units B-184, B-185 and B-188, 80 to 100 meters above the confluence of North Croton and Wedington creeks (Figs. 8 and 11). The springs occur as slow seeps emerging from the walls and floors of short, steep header canyons. Those discharging from sandstone beds are only slightly gypsiferous (L41SN15-18 and L41SN20-22), while those discharging immediately adjacent to gypsum outcrops tend to be moderately gypsiferous (L41SN4-9, L41SN13 and L41SN14).

#### TERRACE PROFILES

Each of the seven alluvial terrace profile exposures recorded as localities (L41KT1, L41KT3, L41KT7, L41KG2, L41KG14, L41KG20 and L41SN32) documents a part of the physical evidence on which the geomorphological interpretation of a specific terrace is based. Interpretations of the terrace systems associated with the three reservoir basin mainstems are summarized in the preceding discussion of the project area geology and are treated in more detail in Appendix V.

#### SITE REMNANTS

Five localities were recorded which appear to represent the remnants of essentially destroyed aboriginal sites. Cultural material was observed only on bulldozer spoil piles resulting from brush clearing at L41KG10 and L41KG11. At L41KG13, L41SN11 and L41SN12 the soil has been stripped away by sheet erosion, apparently carrying the cultural material of aboriginal sites with it, leaving only a few scattered specimens about the roots of pedestaled junipers.

#### COPPER SULPHATE OUTCROPS

Exposures of very thin copper sulphate lenses were found at four localities in the eastern Dam Site 19 basin (L41KG3, L41SN3, L41SN10 and L41SN19). In all four cases, the mineral was found in a clay or fine sand matrix directly atop a bed of gypsum of the Permian Blaine Formation. The mineral is probably a secondary oxidized precipitate, either brochantite or antlerite (Pough 1960:189-191). Copper sulphate was found in an aboriginal feature context at 41SN27 (see Table 27), and similar deposits were briefly mined at site 41SN73 in historic times (Part 2, Appendix I).



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### COLLAPSED ROCKSHELTERS

Three localities were recorded at which resistant beds were undercut by stream erosion at some point in the past, probably formed rock-shelters for a short time, and then collapsed. At L41KG1 the resistant bed is conglomerate of the San Angelo Formation, at L41SN1 it is moderately consolidated sandstone of the Choza Formation, and at L41SN37 it is the massive Eskota gypsum of the Whitehorse Group. It is doubtful that any of these materials have sufficient strength to carry even their own weight for very long, and the shelters must have been very short-lived. Any fill which may have occupied the floor of L41SN1 has been scoured away by erosion. The former floors of L41KG1 and L41SN37 are obscured by roof-fall, but no cultural material is visible downslope. There is no direct evidence of human occupation at any of the three localities.

### DOLOMITE CONCENTRATIONS

L41SN36 is a puzzling locality. Nine dolomite slabs, ranging from 30 to 70 centimeters in diameter and 5 to 10 centimeters in thickness, were found scattered over an area of 1 by 2 meters on a high upland slope overlooking the Croton Creek valley. There is no dolomite outcrop within a 1-kilometer radius of the locality. Although the slabs exhibit no evidence of human modification, it seems likely that they must have been brought to the spot. When and for what purpose this was done is unknown.

### CONCLUSIONS AND INTERPRETATIONS

The 1981 Prewitt and Associates, Inc. investigations in the Brazos Natural Salt Pollution Control Project area examined a sufficiently extensive and quantifiable sample of the area to permit reliable assessments of the character, distribution and density of aboriginal archeological sites. Certain aspects of the environment are identified as functionally related to the distribution and condition of the sites. Tentative statements can be made regarding the settlement pattern which the distribution of the sites reflects, and the chronological placement of the sites.

The dominant site form in the project area is an open campsite covering a relatively small area and exhibiting a very low density of cultural material. The only cultural features that have been identified at these sites are rock-lined hearths and a few features resembling small burned rock middens (possibly discard piles of exhausted boiling stones in most cases). A very limited range of artifactual material occurs at the aboriginal sites: infrequent projectile points and other bifacial and unifacial chipped stone tools, simple battered and abraded stone tools (also infrequent), lithic debitage and burned rock.

High lag concentrations of alluvial gravels, carried into the area by local streams during the late Pleistocene and early Holocene epochs from outcrops of the Pliocene Ogallala Formation and Triassic Dockum Group along the eastern edge of the Llano Estacado, were exploited for lithic raw material. Various medium- and coarse-grained quartzites were used for battered/abraded stone tools and as hearthstones and boiling stones. Cherts, Ogallala quartzite (i.e., "Potter chert") and silicified wood were strongly preferred for chipped stone tool manufacture.

Sites typically occur along valley margins on high bedrock benches or the streamward edges of canyon rims. These landforms provide commanding views of the adjacent valleys and access to cooling breezes. Smaller tributary canyons were preferred over the larger mainstem valleys of Croton, Salt Croton and North Croton creeks. This is undoubtedly related to the pattern of groundwater discharge; the relatively fresh water of the upper groundwater unit tends to discharge at high elevations. The upper reaches of small tributary canyons are much more likely to provide a reasonably stable supply of potable water than are the brine-contaminated mainstems. Sites in these canyons enjoy proximity to drinking water and a clear view of areas in which faunal quarry congregate in search of the same water.

The landforms on which sites most commonly occur also tend to be unstable and undergo steady deflation by sheet and rill erosion. The dominant soils of these landforms are Ochrepts and Orthents of Lithic subgroups, and cultural deposits in such contexts are usually severely deflated and displaced. It is likely that many aboriginal sites have been completely destroyed. At best, one occasionally encounters a site at which a protected segment has been shallowly buried by colluvial and eolian deposition. Sealed, deeply buried cultural deposits could possibly be found in alluvial fill terraces of late Holocene or earlier origin, but no such sites have been identified to date in the project area.

Site density is relatively high at approximately one site per 100 acres, or roughly one site per half square kilometer. But again, the sites tend to be small and to contain sparse cultural materials. Given the deflated context of the sites, it is likely that most of the cultural materials at each are exposed on the surface. The visible artifact density may be expected to serve as a reliable indicator of intensity of occupation under these conditions.

In this light, it might be noted that the artifact density at 71.0 percent of the recorded sites was classified as "diffuse," and an additional 11.5 percent are isolated cultural features or artifacts. Only 9.9 percent of the sites exhibited an artifact density sufficiently high to be classified as "dense" on a locally relative basis. It is doubtful that even the largest of the latter sites contains more than 5000 specimens, including the burned rock and lithic debitage. By contrast, over 57,000 specimens have been recovered in a 2 percent excavation sample of the Loeve-Fox Site in Central Texas, and this figure does not include burned rock, micro-thinning flakes or floral/faunal material (Elton Prewitt, personal communication, 1981).

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In short, the aboriginal sites of the project area generally exhibit a very low intensity of occupation, and temporary use on the order of a few days or weeks is commonly indicated. Variations in site size are probably a function of aboriginal group size and number of components. The larger sites could reflect either repeated short-term use of favored locations by small groups, or single short-term use by a large group. The patterning of rock-lined hearths at sites with numerous exposed features in broad deflated areas suggests that both mechanisms may have operated. For example, the 13 visible hearths at 41KG38 are scattered about the site in no particular recognizable pattern in the manner one would expect if the site had been repeatedly used. In contrast, 24 exposed hearths at 41SN34 are evenly spaced with each feature situated 3 to 5 meters from its neighbors. This patterning certainly suggests a single occupation by a large structured group. It is inferred that each hearth possibly represents a family (or residence) unit.

Skinner (1973:6) has suggested that the settlement pattern might fit either a restricted wanderer or central-based wanderer model. In the former case, one would expect to find sites of similar size and character throughout the area, and in the latter case, it should be possible to identify more intensively occupied base settlements.

At first glance, the data seem to support the restricted wanderer model since none of the sites contain evidence which suggests intensive occupation. However, as Skinner (1973:6) noted, the survey area is limited to intermediate and minor order tributaries, and the base settlements of a central-wanderer pattern might be expected to occur along the Salt Fork and mainstem of the Brazos River. This simple dichotomous approach fails to consider changes in resource availability and subsistence technology through time. For example, Paleoindian groups may have crossed the area in search of Pleistocene megafauna, and Late Prehistoric or Historic groups may have done so in pursuit of bison herds. The unstated but assumed broad-spectrum food collecting of Skinner's models seems most appropriately applicable to the Archaic.

Certainly, the present data indicate use of the survey area by highly mobile groups throughout aboriginal times, but it seems imprudent to carry the inference any further on the basis of the current data. Given the rather marginal character of the local environment, even intense food collectors would probably find it necessary to range across a large territory. It is reiterated that the survey area is rather small and environmentally restricted, and the data base is ill-suited to a more sophisticated interpretation of aboriginal settlement patterns and subsistence strategies.

No excavations of stratified sites have taken place within the immediate vicinity of the project area, nor are any absolute dates available for chronological diagnostics. Any cultural-historical interpretations must therefore rely on the developed chronologies of adjacent regions. As discussed in the Archeological Background, the best nearby comparative data is derived from the Llano Estacado and its eastern margin; established Central Texas chronologies are also useful (Patterson 1977; Prewitt 1981; Weir 1976a, 1976b).

Following this interpretive base, over 75 percent of the chronologically classifiable components relate to the Archaic (see Table 21). Many of the Archaic dart points are not typologically classifiable, but those that are seem predominantly late (c.f. types Castroville, Edgewood, Ensor, Trinity and Marshall). A Nolan point from 41KG40 suggests a middle Archaic component. A specimen from 41SN62 possibly classifiable as type Martindale suggests an early Archaic component, but a Gower fragment from 41KG59 is more reliably early (Crawford 1965:95-96; Shafer 1963:79-81).

The apparent dearth of early components within the Archaic is consistent with previous observations in the immediate vicinity (Etchieson et al. 1978, 1979) and on the Llano Estacado (Hughes 1976). Holliday (n.d.:34) has noted that the early Archaic and first half of the middle Archaic coincide with the hypothesized Altithermal climatic period of the Southwest (Antevs 1948, 1955). The stratigraphy at the Lubbock Lake Site on the Llano indicates a very dry climate from approximately 6000 to 3000 B.C. which is associated with intensive eolian deposition. Essentially modern conditions appear to have prevailed since that time (Holliday n.d.:35). Lubbock Lake is only 100 kilometers to the west, and if similar climatic deterioration occurred on the Rolling Plains during the Altithermal, it is hardly surprising that so few early and middle Archaic components should be present.

At the ends of the time scale, one possible Paleoindian component was identified at 41SN43 where a burinated biface and burned rocks may have been associated with Pleistocene faunal material. Private collectors report finding projectile points of the types Clovis, Folsom, Meserve and Plainview in the project area vicinity. Four Late Prehistoric components have been identified on the basis of the presence of arrow points including the types Cuney, Harrell, Huffaker and Scallorn. The Cuney classification at 41SN57 is made with reservations, but, if accurate, is certainly intriguing; the type is indigenous to the Hasinai area (Anderson cluster) of central eastern Texas (Suhm and Jelks 1962: 261). Its presence through trade is certainly conceivable; Late Caddoan ceramics are widely distributed as tradeware through western Texas (Krieger 1946). Finally, a single uniface from 41KT24 which may be a gunflint of aboriginal manufacture suggests an Historic aboriginal component. It is noteworthy that a Plains end scraper was also found at that site.

## RECOMMENDATIONS

### SITE SPECIFIC RECOMMENDATIONS

Further investigations are recommended for 21 sites; this represents 17.4 percent of the total number of aboriginal sites recorded to date within the project area (Tables 22 and 23). Eleven sites are recommended for testing, eight for surface collection, and two for field reassessment. The research potential of the remaining 100 sites is low, and in most cases may have been exhausted by the documentation of their

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surface indications. These sites are composed of isolated finds of cultural features or artifacts, or have been entirely deflated and their contents severely displaced, and all exhibit very low densities of cultural materials. The latter sites offer little hope of buried cultural remains and appear to be too disturbed for fruitful controlled surface collection.

TABLE 22  
SUMMARY OF SITE-SPECIFIC ASSESSMENTS AND RECOMMENDATIONS

| Assessment/Recommendation                       | Number | Percent |
|---|--------|---------|
| High Potential (Testing)                        | 11     | 9.1     |
| Limited Potential<br>(Surface Collection)       | 8      | 6.6     |
| Unknown Potential (Reassessment)                | 2      | 1.7     |
| Low Potential (No Further Work<br>at this Time) | 100    | 82.6    |
| TOTAL   | 121    | 100.0   |

Although none of the sites are assessed to warrant nomination to the National Register of Historic Places on the basis of the present survey, some of the sites may be assessed as eligible for nomination following completion of the additional investigations suggested below. The present assessments are in terms of the expected research potential of the individual sites and are stated as high, limited, low and unknown in Table 22. A summary of the assessments and recommendations for those sites rated as high, limited and unknown potential is presented in Table 23. While it is felt that the remaining sites rated as having low potential do not warrant further work at this time, research problems raised in the future may necessitate that some of these sites be re-examined in light of new data or investigation techniques.

The 11 sites suggested for testing (41KT8, 41KT17, 41KT21, 41KT24, 41KG38, 41KG47, 41SN4, 41SN27, 41SN33, 41SN34 and 41SN35) are expected to contain intact, buried cultural deposits. Most of the sites are on bedrock benches or canyon rims and are partially deflated with numerous exposed cultural features. Intact cultural features (mostly rock-lined hearths) and undisplaced occupational debris are expected to be shallowly buried by colluvial and eolian deposits in their undeflated portions. The sites therefore offer potential for the documentation of undisturbed aboriginal features and activity areas. Excavations at these sites should be shallow (it is doubtful that the cultural deposits will lie more than 25 to 30 centimeters below the surface) and extensive. The deflated features at these sites should be carefully mapped and documented, and feature-specific collection of their contents is suggested.

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PREWITT AND ASSOCIATES INC. AUSTIN TX F/8 S/11  
A PRELIMINARY ASSESSMENT OF THE CULTURAL RESOURCES IN THE BRAZO--ETC(U)  
NOV 81 J P THURMOND, N D FREEMAN, S L ANDREWS DACH63-81-C-0095

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TABLE 23

SUMMARY OF ASSESSMENTS AND RECOMMENDATIONS  
FOR ABORIGINAL SITES AT WHICH FURTHER  
WORK IS SUGGESTED

| Site   | Assessment  | Recommendations   |
|--------|---|---|
| 41KT8  | Moderately deflated but exhibits a dense surface scatter of cultural material and may contain additional shallowly buried cultural remains. High potential; possibly eligible for National Register.*   | Limited exploratory excavations to investigate potential presence of shallowly buried cultural deposits.  |
| 41KT11 | Cultural deposits appear completely deflated and severely displaced. Site exhibits high density of cultural material, but context has been destroyed. Limited potential; not eligible for National Register.  | Uncontrolled surface collection of all visible cultural materials as a regional comparative sample.   |
| 41KT12 | Cultural deposits appear completely deflated and severely displaced. Site exhibits high density of cultural material, but context has been destroyed. Limited potential; not eligible for National Register.  | Uncontrolled surface collection of all visible cultural material as a regional comparative sample.  |
| 41KT16 | Cultural deposits appear largely deflated and severely displaced. Site exhibits high density of cultural material over very large area, reflecting both habitation and lithic procurement activity in association with gravel deposit, but context has been destroyed. Limited potential; not eligible for National Register. | Surface collection of representative samples of both modified and unmodified lithic material for study of aboriginal lithic raw material utilization. |

\*National Register of Historic Places.

Table 23, continued

| Site   | Assessment  | Recommendations  |
|--------|---|--|
| 41KT17 | Moderately dense concentration of cultural material appearing on surface of Late Holocene fill terrace remnant. Not possible to assess depth and integrity of deposits on basis of surface indications. Buried cultural remains quite possible; high potential; site may be eligible for National Register.     | Limited exploratory excavations to test depth, integrity and character of cultural deposits; seek recovery of chronological diagnostics to test geomorphic interpretation of landform age. |
| 41KT19 | Cultural deposits appear completely deflated and severely displaced. Site exhibits moderately high density of cultural material, but context has been destroyed. Limited potential; not eligible for National Register.   | Uncontrolled surface collection of all visible cultural material as a regional comparative sample.   |
| 41KT21 | Exposed site area is largely deflated, but shallowly buried cultural remains may occur in intact soil to immediate south. High potential; possibly eligible for National Register.  | Limited exploratory excavations to immediate south of exposed site area to test for presence of shallowly buried cultural remains.   |
| 41KT24 | Cultural deposits along southwestern margin and entire northeastern half of site appear largely deflated and displaced, but erosion in center of southwestern half of site has been minimal. Shallowly buried cultural remains may occur in this area. High potential; possibly eligible for National Register. | Limited exploratory excavations in center of southwestern half of site to test for presence of shallowly buried cultural remains.  |
| 41KG24 | Cultural deposits appear completely deflated and severely disturbed. Site exhibits moderately high density of cultural material, but context has been destroyed. Limited potential; not eligible for National Register.   | Uncontrolled surface collection of all visible cultural material as a regional comparative sample.   |



Table 23, continued

| Site   | Assessment  | Recommendations   |
|--------|---|---|
| 41KG38 | Exposed site area is largely deflated but has suffered little displacement, and exhibits 13 cultural features. Additional shallowly buried cultural remains may occur in intact soil to immediate northeast. High potential; possibly eligible for National Register. | Careful documentation and mapping of deflated features; limited exploratory excavations to immediate northeast of exposed site area to test for presence of shallowly buried cultural remains.                              |
| 41KG47 | Presently visible density of cultural material is low, but site has suffered little from erosion and covers a large area. Shallowly buried cultural deposits are likely to occur within site. High potential; possibly eligible for National Register.                | Limited exploratory excavations within exposed site area to test for presence of shallowly buried cultural remains.   |
| 41SN4  | Exposed site area is largely deflated but has suffered little displacement and exhibits 12 cultural features. Shallowly buried cultural remains may lie to immediate south. High potential; possibly eligible for National Register.                                  | Careful documentation and mapping of deflated cultural features; limited exploratory excavations to immediate south of exposed site area to test for presence of shallowly buried cultural remains.                         |
| 41SN12 | Cultural deposits appear completely deflated and severely deflated. Site exhibits high density of lithic procurement debitage in association with a gravel deposit, but context has been destroyed. Limited potential; not eligible for National Register.            | Surface collection of representative samples of both modified and unmodified lithic material for study of aboriginal lithic raw material utilization.   |
| 41SN15 | Recorded in 1973 and not revisited by present survey. Apparently exhibits high density of cultural material and multiple deflated features. Additional shallowly buried cultural remains may be present. Unknown potential; possibly eligible for National Register.  | Should be revisited and reassessed during full inventory survey. At the least, exposed features should be carefully documented and mapped. Testing for presence of shallowly buried cultural remains may also be warranted. |

Table 23, continued

| Site   | Assessment  | Recommendations   |
|--------|---|---|
| 41SN16 | Recorded in 1973 and not revisited by present survey. Apparently exhibits high density of cultural material and at least 3 features. Additional shallowly buried cultural remains may be present. Unknown potential; possibly eligible for National Register.                         | Should be revisited and reassessed during full inventory survey. At the least, exposed features should be carefully documented and mapped. Testing for presence of shallowly buried cultural remains may also be warranted. |
| 41SN27 | Exposed site area is largely deflated but has suffered little displacement and exhibits 5 cultural features. Additional shallowly buried cultural remains may occur in intact soil to immediate south. High potential; possibly for National Register.                                | Careful documentation and mapping of deflated features; limited exploratory excavations to immediate south of exposed site area to test for presence of shallowly buried cultural remains.                                  |
| 41SN33 | South half of site is largely deflated and has suffered little displacement and exhibits 6 cultural features. North half is largely intact and is likely to contain shallowly buried cultural remains. High potential; possibly eligible for National Register.                       | Careful documentation and mapping of deflated cultural features in south half of site; limited exploratory excavations in north half to test for presence of shallowly buried cultural remains.                             |
| 41SN34 | Northeastern half of site is largely deflated but has suffered little displacement and exhibits 24 cultural features. Southwestern half is largely intact and is likely to contain shallowly buried cultural remains. High potential; possibly eligible for National Register.        | Careful documentation and mapping of deflated cultural features in north-eastern half of site; limited exploratory excavations in south-western half to test for presence of shallowly buried cultural remains.             |
| 41SN35 | Southeastern quarter of site is moderately deflated and has suffered moderate displacement but exhibits 6 cultural features. Remainder of site is largely intact and is likely to contain shallowly buried cultural remains. High potential; possibly eligible for National Register. | Careful documentation and mapping of deflated cultural features in south-eastern quarter of site; limited exploratory excavations in remainder of site to test for presence of shallowly buried cultural remains.           |

Table 23, continued

| Site   | Assessment  | Recommendations   |
|--------|---|---|
| 41SN42 | Cultural deposits appear completely deflated and severely disturbed. Site exhibits high density of lithic procurement debitage in association with a gravel deposit, but context has been destroyed. Limited potential; not eligible for National Register. | Surface collection of representative samples of both modified and unmodified lithic material for study of aboriginal lithic raw material utilization. |
| 41SN55 | Cultural deposits appear completely deflated and severely displaced. Site exhibits high density of lithic procurement debitage in association with a gravel deposit, but context has been destroyed. Limited potential; not eligible for National Register. | Surface collection of representative samples of both modified and unmodified lithic material for study of aboriginal lithic raw material utilization. |

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Site 41KT17 forms an exception to this pattern. Cultural materials were found atop a remnant of the 6-to-9-meter Croton Creek fill terrace which is presumed to be of late Holocene age. Limited excavations are recommended to establish the depth, integrity and character of the cultural deposits and to seek chronological diagnostics in order to test the present interpretation of the age of the terrace system.

Uncontrolled surface collection is recommended at four sites: 41KT11, 41KT12, 41KT19 and 41KG24. The cultural deposits at these sites are completely deflated and have suffered severe displacement of their contents. Any patterning which may have characterized the cultural material has been destroyed, and controlled surface collection is not warranted. However, the sites exhibit a high density of cultural material which could be rapidly extracted through uncontrolled collection. There are so few artifact collections from this area with site-specific provenience that even "grab" samples of this nature are useful for purposes of comparative research.

Four sites are recommended for surface collections of a different kind (41KT16, 41SN12, 41SN42 and 41SN55). All of these sites exhibit an association of lithic procurement debitage with lag deposits of stream gravels, although 41KT16 also contains a significant quantity of occupational debris. The sites offer a potential for the accumulation of data regarding aboriginal practices in selecting and initially processing lithic raw materials. It is recommended that surface collection of comparative samples of both cultural material and unmodified gravels be made at each site. The sites are large and contain considerable amounts of materials, and the selection of a representative sample from each will probably be the most practical approach. A grid should be imposed on each site and a random sample of units should be selected for collection.

Finally, two sites were recorded by SMU in 1973 which suggest promise but which were poorly documented (41SN15 and 41SN16). The sites were not revisited by the present survey. Both are described as relatively large with high densities of cultural material and multiple deflated cultural features. It is suggested that the sites be revisited during the full inventory survey. Any exposed features should be carefully mapped and documented, and the potential for the presence of additional intact, shallowly buried cultural deposits should be assessed.

### ADDITIONAL RECOMMENDATIONS

A few suggestions are offered for the conduct of the full inventory survey. First and foremost, it is recommended that the reservoir basin surveys not be limited to the areas below the floodpool elevations. As shown in this report, the landforms of maximum site density are the high bedrock benches and canyon rims which often coincide with the proposed floodpool shorelines. It is predicted that these areas will be extremely unstable and susceptible to erosion.

Bolen and George state that the peripheral vegetation along the reservoir basins will be eliminated:

A zone quite likely devoid of any vascular vegetation will develop at least through the high water mark. Halophytic annuals can be expected to invade this zone early in the impoundments' history, but as the salinity increases, these too will fail. With further accumulations of salt, those sites adjacent to the impoundment area that lie just above the water table can also be expected to be vegetatively sterile (Bolen and George 1971: c-3).

The authors conclude that severe erosion is likely to result:

The red soils of the region . . . are unstable and quickly erode . . . wave action or other disturbances (motor boats, for example) will severely erode shorelines into steep-sided, unstable banks. The vertical face of such banks will slump off in this regime until a new face is developed and the process begins anew (Bolen and George 1971: c-9).

These predictions are believed to be quite accurate. The Permian red-bed sediments of the area are very poorly consolidated as a rule, and once devegetated, can be expected to erode rapidly. It is virtually certain that many sites along the peripheries of the reservoirs will be severely disrupted or destroyed. Therefore, it is strongly recommended that the project area be expanded during the full inventory survey to include a belt at least 250 meters wide beyond the floodpool boundary of each reservoir.

The system of 500x500-meter quadrats employed by the present survey should be used during the full inventory survey for documentation of survey coverage. The system provides a convenient structure for the recording of local environmental information and the summarization of the cultural resources. Further, the area actually surveyed can be easily and accurately plotted on USGS maps using the UTM system, and survey coverage can be precisely quantified. This quantification is indispensable to any statistical manipulation of the survey data. Documentation of sites, localities and survey units should be maintained at least at the level of detail achieved by the present survey.

Experience in the field and the interpretations of the local fluvial geology have demonstrated that survey coverage must be flexible and must be adapted to the terrain and the character of the deposits. It is pointless to intensively survey heavily vegetated upland areas; one simply cannot see the ground in the knee-high undergrowth. Survey crews should concentrate on the exposures of roadcuts, erosional areas and so forth, and otherwise cover the areas with sufficient care to identify any historic structures which may be present. In heavily dissected badland areas of severe relief it is not possible to follow linear

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transects; survey crews can move much more rapidly and efficiently by following the topography.

Interpretations of the alluvial deposits indicate that it is a waste of time to intensively survey the surfaces of the lower fill terraces such as the 6-to-9-meter terrace along North Croton Creek. These landforms are actively aggrading and cultural deposits any earlier than the past 50 years will be buried. Survey crews should look for historic structures atop these landforms, but otherwise should concentrate on the careful inspection of all available stream and road cuts through these deposits for profile exposures of buried sites.

Surveyors should consult the local ranchers regarding site locations; these individuals are intimately familiar with their landholdings and are often aware of the locations of major aboriginal and historic sites.

It is strongly recommended that survey crews be provided with four-wheel drive vehicles of high clearance. The roads of the area are often unimproved tracks and are nearly impassable, especially when wet. Rattlesnakes are numerous and aggressive, and surveyors should be supplied with snake leggings. A minimum crew size of three is recommended for reasons of safety; it could easily become necessary to carry an injured crewmember out of a survey area. Finally, the terrain is complex, and each crewmember should be required to carry appropriate topographic maps and a compass at all times while in the field.

APPENDIX I: Prehistoric Site Descriptions

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and

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## INTRODUCTION

The following appendix presents detailed descriptions of the 121 prehistoric archeological sites recorded by the 1973 Southern Methodist University (SMU) reconnaissance and the 1981 Prewitt and Associates, Inc. sampling survey of the Brazos Natural Salt Pollution Control Project area in Kent, King and Stonewall counties, Texas. Each site description includes: (1) site designations; (2) project area context (specific reservoir basin or pipeline); (3) designation of the survey unit(s) which incorporates the site; (4) the USGS 7.5' (1:24 000) map sheet on which the site is plotted; (5) elevation of the site in both feet and meters above Mean Sea Level; (6) site dimensions in meters; (7) a description of site location; (8) a description of the cultural features and other cultural remains observed at the site; (9) descriptions of the physiography, (10) lithology (outcropping bedrock), (11) soil, and (12) vegetation of the immediate site area; (13) a summary of the last observed condition of the site; (14) an assessment of its information yield potential and eligibility for nomination to the National Register of Historic Places; and (15) recommendations for the future management of the site.

Most of the information presented herein for the 30 sites recorded by SMU (41KT5-11, 41KG24-32 and 41SN3-16) has been derived from their survey forms and other field notes, and from the published report of that reconnaissance (Skinner 1973). Only two of the SMU sites were revisited by the present survey: 41SN3 and 41SN13.

The designations used as primary site references by this study are trinomial numbers assigned by the Texas Archeological Research Laboratory (TARL) in Austin. The trinomial number system of archeological site designation is in common use across the United States. A two-digit prefix designates each state, reflecting its position within an alphabetical listing of the 48 contiguous states (Alaska and Hawaii have been added to the end). The prefix for Texas is therefore 41. This prefix is followed by a two-letter county designation. Three such designations are relevant to the present study: KT for Kent County, KG for King County and SN for Stonewall County. Finally, the sites are numbered sequentially within each county in order of discovery. Thus, 41SN43 was the forty-third archeological site to be recorded in Stonewall County, Texas.

At the time of the 1973 SMU reconnaissance, that institution did not coordinate the assignment of trinomial numbers with TARL. To avoid confusion, since specific site numbers were often duplicated by the two institutions, trinomial numbers assigned independently by SMU were preceded by a lower case "x" (e.g., x41SN3). All of the sites recorded by SMU within the project area have subsequently been assigned TARL trinomial numbers. The TARL designations are used to refer to the SMU sites in this report, but the SMU designation for each relevant site is also provided in the descriptions which follow.



## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

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Each description of site location is divided into two parts. The general location of the site within the project area is first stated for purposes of orientation; for example, "In the central portion of the Dam Site 19 basin, at the lower end of an unnamed left-bank tributary of North Croton Creek." Information sufficiently specific to facilitate the plotting of the site on a USGS 7.5' map sheet is then provided. For this purpose, we have used triangulation data based on named, easily identifiable reference points which appear on the USGS maps; for example, "The site is .3 kilometer northwest of the Pen Branch Tank outfall and .85 kilometer southwest of the confluence of Pen Branch and North Croton Creek." The locations of the sites within the project area are illustrated in Figures 6 through 8.

Each description of the prehistoric cultural manifestations at a given site includes: (1) a classification of the density of cultural material occurring on the surface of the site (diffuse, moderately dense or dense); (2) a summary of the character of that material (e.g., chipped stone flakes, heat-fractured rocks, etc.); (3) the predominant source materials of the lithic specimens; and (4) descriptions of any cultural features and/or artifact concentrations noted at the site. If two or more cultural features were observed, their descriptions are presented in a separate table.

One lithic raw material term which is used in this appendix should be clarified. The term "Ogallala quartzite" is used to refer to a gray to brown siliceous siltstone which is often alternatively termed "Potter chert" in the archeological literature of the region. The material derives from the Potter Gravels of the Pliocene Ogallala Formation (Patton 1923), and is locally available in alluvial gravel deposits.

The classes of landforms used to characterize site physiography (e.g., bedrock bench, canyon rim) follow the geomorphological classification illustrated in Figure 2. Characterizations of site lithology and soils combine the field observations of the survey crews with the results of the environmental consultants' investigations (Appendices V and VI) and previously existing published references. Our primary reference on the local outcrop lithology is the Geologic Atlas of Texas, Lubbock Sheet (Barnes 1967). Soil descriptions include the soil series designations defined by the published county soil surveys (Goerdel and Watson 1975; Richardson and Girdner 1973) and the Soil Conservation Service Seventh Approximation classification of the soil at the site to the subgroup level (Soil Survey Staff 1975).

Assessments of site research potential and site-specific management recommendations assume, unless otherwise stated, that the site will be severely disturbed or destroyed by project construction. The bases for this assumption are discussed in the main body of this report.

The site descriptions which follow are arranged in alphanumerical order by county. The prehistoric sites recorded to date within the Brazos Natural Salt Pollution Control Project area are discussed in a more general vein and our management recommendations are summarized in the concluding sections of the body of the report.

KENT COUNTY SITES

41KT5 (x41KT1; Dam Site 10, South of Survey Unit B-7)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1810 feet/552 meters

Dimensions: 35 meters N-S by 17 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the southern margin of the large salt flat at the head of Short Croton Creek. The site is 4.85 kilometers west of the confluence of that stream with Croton Creek and 5.33 kilometers southwest of the confluence of Hot Springs and Croton creeks.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. Two gouge-shaped implements and a biface failure were observed. The debitage and tools are primarily of local cherts. Site area is relatively small, and no features or artifact concentrations were observed.

Physiography: Valley margin slope, approximately 7 meters above the salt flat.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Breaks and Yahola soils mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderately dense cover of juniper, mesquite, cacti and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: The site is relatively small and exhibits a very low density of cultural material with no patterning in its distribution. Given the topographic position of the site, it is highly likely that the cultural deposit has been entirely deflated. Further investigations would be unlikely to produce additional significant data. Thus, the site exhibits a low information yield potential and is not considered to be eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT6 (x41KT2; Dam Site 10, South of Survey Unit B-5)

USGS Quadrangle: 7.5' Jayton 1958

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Elevation: 1820 feet/555 meters

Dimensions: 30 meters N-S by 20 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the southern margin of the salt flat at the head of Short Croton Creek. The site is 5.5 kilometers west of the confluence of Short Croton and Croton creeks and 5.3 kilometers southwest of the junction of Hot Springs and Croton creeks.

Description: Diffuse scatter of chipped stone tool fragments, cores, flakes, heat-fractured rocks and a ground stone tool fragment. Raw material of the lithic specimens was not recorded. The site is of moderate size; no discernible concentrations or features were noted.

Physiography: Bedrock bench, approximately 7 meters above the salt flat.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Breaks and Yahola soils mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torrior-thent.

Vegetation: Moderately dense cover of mesquite, with cactus and yucca also present.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are entirely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. This site exhibits a low information yield potential and is not considered to be eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT7 (x41KT3; Dam Site 10, West of Survey Unit B-4)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1810 feet/552 meters

Dimensions: Two areas of 10 meters N-S by 5 meters E-W each.

Location: At the western extremity of the Dam Site 10 basin, on the western margin of the large salt flat at the head of Short Croton Creek. The site is 5.6 kilometers west of the confluence of Short

Croton and Croton creeks and 5.05 kilometers southwest of the confluence of Hot Springs and Croton creeks.

Description: Two small, moderately dense scatters of chipped stone cores and flakes, heat-fractured rocks and a ground stone tool. An isolated late Archaic projectile point was found 100 meters to the west of these areas. Raw material of the lithic specimens was not recorded. Site area is relatively small, and no features were observed.

Physiography: Bedrock bench, approximately 8 meters above the salt flat.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Rough Broken Land mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderately dense cover of mesquite, cactus, yucca and short grasses.

Condition: Brush clearing by heavy machinery has engendered severe sheetwash erosion.

Assessment: Surface indications suggest the site comprises the deflated and laterally displaced remains of two hearths and their associated occupational debris. It is improbable that any additional buried cultural deposits are present at the site, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT8 (x41KT4; Dam Site 10, South of Survey Unit B-4)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1820 feet/555 meters

Dimensions: 45 meters NE-SW by 20 meters SE-NW

Location: At the western extremity of the Dam Site 10 basin, on the western margin of the large salt flat at the head of Short Croton Creek. The site is 4.3 kilometers west of the confluence of Short Croton and Croton creeks and 5.3 kilometers south of the confluence of Hot Springs and Croton creeks.

Description: Dense scatter of chipped stone cores, flakes and one abraded quartzite cobble fragment. The chipped stone debitage is primarily chert, with some fine-grained quartzite. The central area of the scatter shows a higher concentration of material. Site area is of

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

scatter shows a higher concentration of material. Site area is of moderate size; no features were observed.

Physiography: Bedrock bench, approximately 12 meters above the salt flat.

Lithology: Poorly consolidated shale, Whitehorse Group.

Soil: Rough Broken Land mapping unit. Soil of the immediate site area is a clay loam, classifiable as a Lithic Ustorthent.

Vegetation: Sparse cover of mesquite, short grasses and forbs.

Condition: Disturbed by sheet erosion along margins of site area.

Assessment: The site has suffered only moderate deflation through erosion, yet exhibits a relatively dense concentration of cultural material. Much of the soil within the site is intact, and it is possible that additional cultural deposits, perhaps including intact cultural features, are shallowly buried within the site. Information yield potential seems high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: Excavations of a limited, exploratory nature should be conducted to investigate the possible existence of intact, shallowly buried cultural deposits at the site.

### 41KT9 (x41KT5; Dam Site 10, Survey Unit B-9)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters

Dimensions: 10 meters N-S by 20 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the southeastern margin of the large salt flat at the head of Short Croton Creek. The site is 4.4 kilometers west of the junction of that creek with Croton Creek and 4.8 kilometers southwest of the confluence of Hot Springs and Croton creeks.

Description: Diffuse scatter of chipped stone flakes, cores, utilized flakes and heat-fractured rocks. The raw material of the specimens was not recorded. Site area is relatively small, and no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench, approximately 5 meters above the salt flat.

Lithology: Shallow mantle of weathered, poorly consolidated sandstone underlain by a relatively resistant gypsum bed. Both are members of the Whitehorse Group.

Soil: Breaks and Yahola soils mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torrior-thent.

Vegetation: Mesquite, cactus and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are entirely deflated and have suffered severe lateral displacement. The site is quite small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT10 (x41KT6; Dam Site 10, Survey Unit B-9)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters

Dimensions: 27 meters N-S by 5 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the southeastern margin of the large salt flat at the head of Short Croton Creek. The site is 2.8 kilometers southwest of the outfall of Coker Tank and 4.3 kilometers west of the confluence of Short Croton and Croton creeks.

Description: Diffuse scatter of chipped stone flakes, cores, one retouched flake and heat-fractured rocks. The raw material of the specimens was not recorded. Site area is small but elongated. No discernible features or artifact concentrations were noted.

Physiography: Bedrock bench, approximately 5 meters above the salt flat.

Lithology: Shallow mantle of weathered, poorly consolidated sandstone underlain by a relatively resistant gypsum bed. Both are members of the Whitehorse Group.

Soil: Breaks-Yahola soils mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torrior-thent. Gypsum bedrock is exposed over much of the site area.

Vegetation: Mesquite, juniper, cacti and short grasses.

Condition: Severely disturbed by sheet and gully erosion.

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**Assessment:** Surface indications suggest that the cultural deposits are entirely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41KT11 (x41KT7; Dam Site 10, Survey Unit A-30)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters

Dimensions: 150 meters N-S by 20 meters E-W

**Location:** In the middle reaches of the Dam Site 10 basin, at the lower end of Panther Canyon. The site is 0.7 kilometer southeast of the confluence of Short Croton and Croton creeks and 6.4 kilometers southeast of the confluence of Croton and Hot Springs creeks.

**Description:** Moderately dense scatter of chipped stone flakes, cores, retouched flakes and heat-fractured quartzite. The debitage is primarily chert with some fine-grained quartzite. The cores appear to be intensively worked. Site area is relatively large, but no discernible features or artifact patterning were noted.

**Physiography:** Bedrock bench, approximately 9 meters above the present Panther Creek channel.

**Lithology:** Shallow mantle of weathered, poorly consolidated sandstone underlain by a relatively resistant gypsum bed. Both are members of the Whitehorse Group.

**Soil:** Very fine sandy loam; mapped by the SCS as Woodward Series, a Typic Ustochrept; but soil at site is more properly classified as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

**Vegetation:** Mesquite, cacti and short grasses.

**Condition:** Severely disturbed by sheet and gully erosion.

**Assessment:** Surface indications suggest that the cultural deposits are entirely deflated and have suffered severe lateral displacement. Although the site is rather large and exhibits a moderately high density of cultural material, the context of the deposits has been completely destroyed. The site therefore cannot be considered eligible for nomination to the National Register of Historic Places. However, the cultural

material at 41KT11 would provide a useful, easily extractable comparative sample of burned rocks and lithic debitage from a region for which few such collections are presently available. Collection of the material need not be controlled; the present artifact distribution is largely or entirely attributable to post-depositional disturbance.

Recommendations: Uncontrolled surface collection of all visible cultural materials is suggested.

41KT12 (Dam Site 10, East of Survey Unit A-10)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1817 feet/554 meters

Dimensions: 45 meters N-S by 40 meters E-W

Location: At the northern extremity of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 1.9 kilometers southeast of the confluence of Hot Springs and Croton creeks and 2 kilometers northeast of the outlet of Coker Tank.

Description: Moderately dense scatter of heat-fractured quartzite and chipped tools, cores and flakes. The debitage is primarily of local cherts and Ogallala quartzite. One planoconvex uniface with lateral retouch was collected (see Appendix III). One disturbed concentration of heat-fractured quartzite, roughly 2 meters in diameter, was noted. A mineralized fragment of a mammal bone was recovered from a gully wall north of the site area, approximately 1 meter below the terrace surface. This site also has an historic component (see Part 2, Appendix I). Site area is of moderate size.

Physiography: Streamward edge of the third (12-to-18-meter) fill terrace above Croton Creek.

Lithology: Mid to early Holocene terrace fill, sandy clay loam in texture.

Soil: Obaro sandy clay loam, a Typic Ustochrept.

Vegetation: Sparse cover of short grasses and prickly pear.

Condition: The prehistoric component is overlain by a recent farmhouse and its outbuildings. Construction and livestock traffic have engendered severe sheet and gully erosion.

Assessment: The site occurs in association with terrace fill which appears to be of mid to early Holocene age (Appendix V). The only identifiable prehistoric component, represented by the lithic scatter along the streamward edge of the terrace, has suffered severe deflation and lateral displacement. It is likely that the cultural deposit associated with that component was buried no more than 10 to 15 centimeters below



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the terrace tread prior to the advent of the farm complex and post-dates the deposition of the terrace fill. The cultural material associated with the prehistoric component is certainly too severely mixed and displaced to offer a suitable subject for controlled surface collection. Finally, the single bone fragment found in an erosional cut along the northern margin of the site derives from a gravel bed and appears to have been stream rolled. In short, the single identifiable prehistoric component has been severely disturbed, and there is no evidence of buried, intact cultural deposits within the terrace. The prehistoric resource at 41KT12 is not considered eligible for nomination to the National Register of Historic Places, and the same assessment of its historic component is made in Part 2 of this report. However, as in the case of 41KT11, collection of the lithic materials associated with the prehistoric component should be considered. The specimens would provide a useful data base for the study of aboriginal selectivity in choosing raw materials for use in tool manufacture and as hearthstones or boiling stones. Given the disturbed context of the materials, their collection need not be controlled.

Recommendations: Uncontrolled surface collection of the lithic specimens associated with the prehistoric component.

### 41KT13 (Dam Site 10, Survey Unit B-17)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1815 feet/553 meters

Dimensions: 5 meters N-S by 25 meters E-W

Location: In the middle reaches of the Dam Site 10 basin, at the lower end of Short Croton Creek. The site is 0.85 kilometer west of the confluence of Short Croton and Croton creeks and 2.5 kilometers southwest of the outfall of Coker Tank.

Description: Diffuse scatter of chipped stone debitage and heat-fractured rocks. All of the observed material is local quartzite. A small concentration of heat-fractured rocks, roughly 50 centimeters in diameter, was noted at the southwestern extremity of the site; possibly this represents a disturbed hearth. Site area is relatively small.

Physiography: Valley margin slope overlooking an intermittent tributary draw, approximately 7 meters above the floor.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Breaks-Yahola soils mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Sparse cover of mesquite, catclaw, prickly pear, yucca and short grasses.

Condition: Overgrazing and animal traffic have engendered severe sheet erosion.

Assessment: Surface indications suggest that the deposits are entirely deflated and have suffered moderate to severe lateral displacement. Only a single disturbed feature was observed, and it is highly unlikely that any additional cultural remains are present. The information yield potential of the site is low, and further investigations are not likely to produce additional significant data. Site 41KT13 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT14 (Dam Site 10, Survey Unit B-17)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1815 feet/553 meters

Dimensions: 6 meters NW-SE by 40 meters SW-NE

Location: In the middle reaches of the Dam Site 10 basin, at the lower end of Short Croton Creek. The site is 2 kilometers west of the confluence of Short Croton and Croton creeks and 2.45 kilometers southwest of the outlet of Coker Tank.

Description: Diffuse scatter of chert flakes and heat-altered quartzite. One minor concentration of burned rocks, roughly 2 meters in diameter, may represent the remains of a disturbed hearth. Cultural materials diminish in density toward the site periphery. Site area is relatively small.

Physiography: Valley margin slope overlooking an intermittent tributary draw, approximately 7 meters above the floor.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Breaks-Yahola soils mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderately dense cover of juniper, prickly pear and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are entirely deflated and have suffered moderate to severe lateral displacement. Only a single disturbed feature was observed, and it is highly unlikely that any additional buried features or other cultural remains are present. The information yield potential of the site is

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low, and further investigations are not likely to produce additional significant data. Site 41KT14 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT15 (Dam Site 10, Survey Unit B-17)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1815 feet/553 meters

Dimensions: 10 meters N-S by 15 meters E-W

Location: In the middle reaches of the Dam Site 10 basin, at the lower end of Short Croton Creek. The site is 2.1 kilometers west of the confluence of Short Croton and Croton creeks and 2.5 kilometers southwest of the Coker Tank outlet.

Description: Diffuse scatter of heat-fractured quartzite fragments and chipped stone flakes. The debitage is strictly chert and Ogallala quartzite. Site area is relatively small, and no discernible features or artifact concentrations were noted.

Physiography: Valley margin slope overlooking an intermittent tributary draw, approximately 7 meters above the floor.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Breaks-Yahola soils mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderate to dense cover of mesquite, yucca, catclaw, prickly pear and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are entirely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KT15 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT16 (Dam Site 10, Survey Unit B-21)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780-1820 feet/543-558 meters

Dimensions: 60 meters N-S by 30 meters E-W

Location: In the middle reaches of the Dam Site 10 basin, at the lower end of Short Croton Creek. The site is 1.2 kilometers west of the junction of that stream and Croton Creek and 2.85 kilometers south of the outlet of Coker Tank.

Description: Dense scatter of lithic debitage and heat-fractured quartzite, associated with a moderately extensive lag gravel deposit. The debitage is strictly chert and Ogallala quartzite. No discernible features or artifact concentrations were noted.

Physiography: Streamward edge of the third fill terrace above Short Croton Creek.

Lithology: Mid to early Holocene terrace fill, gravelly very fine sandy loam in texture.

Soil: Woodward gravelly very fine sandy loam, a Typic Ustochrept.

Vegetation: Sparse cover of mesquite, prickly pear, tasajilla and short grasses.

Condition: A roadcut has removed a major portion of the site, and it has been moderately to severely disturbed by sheet and gully erosion.

Assessment: The terrace deposit on which the site occurs has been severely dissected by road construction activity and gully erosion, and numerous deep profiles of the deposit are visible. In no case was cultural material observed to occur more than 5 centimeters below the terrace tread. It is highly likely that aboriginal activity at the site entirely post-dates deposition of the terrace fill. The cultural deposit appears to be largely surficial and has suffered severe lateral displacement. Again, much of the deposit has been completely removed in the course of the road construction. It is probable that little of the cultural deposit is intact, and the site cannot be considered eligible for nomination to the National Register of Historic Places. However, as in the cases of sites 41KT11 and 41KT12, the lithic specimens present at the site could profitably be collected to facilitate studies of aboriginal lithic raw material selectivity.

Recommendations: Uncontrolled surface collection should be conducted to facilitate the study of aboriginal selection of lithic raw materials. Given the volume of material present at 41KT16, it may be desirable to draw a random sample. It would also be useful to collect both cultural material and unmodified gravels to permit a comparison of

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

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the proportional representation of different lithic materials within each.

### 41KT17 (Dam Site 10, Survey Unit A-26)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1785 feet/544 meters

Dimensions: 45 meters N-S by 21 meters E-W

Location: In the central portion of the Dam Site 10 basin, at the lower end of Short Croton Creek. The site is 3.5 kilometers northwest of the Daniels microwave tower and 0.85 kilometer west of the confluence of Short Croton and Croton creeks.

Description: Moderately dense scatter of chipped stone tools, flakes and heat-fractured quartzite. One large planoconvex uniface with lateral retouch was collected (Appendix III); two abraded sandstone cobbles were observed. The debitage is mostly of local cherts. Site area is of moderate size; no discernible features or concentrations were noted.

Physiography: Streamward edge of the second fill terrace above Short Croton Creek.

Lithology: Holocene terrace fill, loamy fine sand in texture.

Soil: Yahola fine sandy loam, a Typic Ustifluvent.

Vegetation: Scattered weeds are all that remain in this recently plowed field.

Condition: Site has been plowed to an unknown depth. Surface of site is level, and erosion has probably been minimal.

Assessment: The site occurs on the 6-to-9-meter terrace above Croton Creek, a landform believed to be of late Holocene age (Appendix V). It is somewhat surprising to find an aboriginal site on the surface of a landform which the soils data would suggest was actively accreting within the recent past. A very late prehistoric component may be represented, but no chronological diagnostics were recovered by the survey. Cultural remains near the surface have undoubtedly been disturbed by plowing, but the depth of the cultural deposit cannot be assessed on the basis of the present data. The information yield potential of 41KT17 seems moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: Excavations of a limited exploratory nature should be conducted in order to (1) determine the depth and integrity of the cultural deposit, and (2) seek the recovery of chronological diagnostics.

41KT18 (Dam Site 10, Survey Unit B-26)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780 feet/543 meters

Dimensions: 25 meters N-S by 35 meters E-W

Location: In the middle reaches of the Dam Site 10 basin, in Panther Canyon. The site is 1 kilometer southeast of the confluence of Croton and Short Croton creeks and 4.05 kilometers southeast of the Coker Tank outfall.

Description: Diffuse scatter of chipped stone flakes, cores and heat-fractured quartzite near the center of an extensive lag gravel concentration (L41KT5). The debitage is chert, Tecovas jasper and fine-grained quartzite. Site is of moderate size; no discernible features or patterning of artifacts were noted.

Physiography: Bedrock bench overlooking Panther Creek, approximately 9 meters above the present channel.

Lithology: Shallow mantle of weathered, poorly consolidated sandstone underlain by a relatively resistant gypsum bed. Both are members of the Whitehorse Group. The Permian bedrock is overlain by a lag concentration of Quaternary stream-rolled gravels.

Soil: Gravelly fine sandy loam; mapped as Woodward Series, a Typic Ustochrept; but soil at site is more properly classified as a Lithic Torriorthent.

Vegetation: Sparse cover of mesquite, cacti and short grasses.

Condition: Severely disturbed by gully and sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The density of cultural material is quite low. Further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT19 (Dam Site 10, Survey Unit B-26)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780 feet/543 meters

Dimensions: 100 meters N-S by 50 meters E-W

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**Location:** In the middle reaches of the Dam Site 10 basin, at the upper end of Panther Canyon. The site is 1.2 kilometers southeast of the confluence of Short Croton and Croton creeks and 1 kilometer south of the junction of Panther and Croton creeks.

**Description:** A moderately dense scatter of chipped stone flakes, cores and heat-fractured quartzite at the southern end of the extensive lag gravel concentration recorded as L41KT5. The debitage is primarily quartzite, with some chert and silicified wood. Site area is moderately large, and materials were apparently concentrated on the edge of the scarp (see Physiography). No discernible features were noted.

**Physiography:** Bedrock bench overlooking Panther Creek, approximately 9 meters above the present channel.

**Lithology:** Shallow mantle of weathered, poorly consolidated sandstone underlain by a relatively resistant gypsum bed. Both are members of the Whitehorse Group. A lag concentration of Quaternary stream-rolled gravels overlies the Permian bedrock.

**Soil:** Gravelly fine sandy loam; mapped as Woodward Series, a Typic Ustochrept; but soil at site is more properly classified as a Lithic Torriorthent.

**Vegetation:** Moderately dense cover of mesquite and short grasses with prickly pear, sage, broomweed, thistles and yucca also present.

**Condition:** Severely disturbed by sheet erosion.

**Assessment:** The cultural deposits appear to be entirely deflated and to have suffered severe lateral displacement. Although the site is relatively large and exhibits a moderately dense concentration of cultural materials, the context of the deposit has been entirely destroyed. The site, therefore, cannot be considered eligible for nomination to the National Register of Historic Places. However, the lithic materials at 41KT19 would provide a useful comparative sample for a study of aboriginal lithic raw material selection and utilization. Collection of the material need not be controlled; its present distribution is largely or entirely attributable to post-depositional disturbance.

**Recommendations:** Uncontrolled surface collection of all visible cultural materials or a representative sample thereof.

### 41KT21 (Dam Site 10, Survey Unit A-30)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780 feet/543 meters

Dimensions: 30 meters N-S by 200 meters E-W

Location: In the middle reaches of the Dam Site 10 basin, at the lower end of Panther Canyon. The site is 0.55 kilometer southeast of the confluence of Short Croton and Croton creeks and 0.25 kilometer southwest of the confluence of Panther and Croton creeks.

Description: Dense scatter of chipped stone cores, flakes, re-touched flakes and burned quartzite. The debitage is primarily Ogallala quartzite, with some chert and silicified wood. A possible disturbed hearth, 50 by 100 centimeters in size, was noted at the eastern end of the site. The feature contains 25 burned dolomite fragments, 7 unburned quartzite flakes and 2 unburned chert flakes. The site is associated with a lag concentration of stream-rolled gravels. Two tools were collected; a planoconvex uniface with lateral retouch and a flake with both lateral and distal retouch (Appendix III). Site area is relatively large.

Physiography: Streamward edge of a bedrock bench overlooking Croton Creek, approximately 7 meters above the present channel.

Lithology: Poorly consolidated sandstone, Whitehorse Group, overlain by Quaternary stream-rolled gravels.

Soil: Obaro gravelly fine sandy loam, a Typic Ustochrept.

Vegetation: Moderately dense cover of mesquite and mid grasses, with prickly pear, mormon tea, sage and yucca also present.

Condition: Moderately to severely disturbed by sheetwash and gully erosion.

Assessment: The visible cultural deposits are largely or entirely deflated and have suffered moderate to severe lateral displacement. However, severity of deflation decreases and soil depth increases with distance from the streamward edge of the bench. One exposed but largely intact hearth was observed approximately 25 meters back from that edge. It is quite possible that intact cultural features and other remains are shallowly buried immediately upslope (south) of the present visible surface scatter of cultural materials. The information yield potential seems moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: Excavations of a limited and exploratory nature should be conducted in order to test for the presence of intact, shallowly buried cultural remains to the immediate south of the presently visible surface scatter.

41KT23 (Dam Site 10, Survey Unit B-4)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters



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Dimensions: 90 meters N-S by 30 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the western margin of the large salt flat at the head of Short Croton Creek. The site is 5.2 kilometers west-northwest of the confluence of Croton and Short Croton creeks and 3.4 kilometers southwest of the outlet of Coker Tank.

Description: Diffuse scatter of chert flakes and heat-fractured quartzite. One discrete concentration of burned quartzite, roughly 1 meter in diameter, was observed near the center of the site. A disturbed hearth is presumably represented. Site area is of moderate size.

Physiography: Bedrock bench overlooking and approximately 3 meters above the salt flat.

Lithology: Resistant gypsum bed of the Whitehorse Group overlain by a shallow mantle of fine sandy loam. Mantle could be weathered sandstone or alluvium.

Soil: Fine sandy loam; mapped as Woodward Series, a Typic Ustochrept; soil in immediate vicinity of site perhaps more accurately classified as a Lithic Torriorthent.

Vegetation: Moderate cover of mesquite and mid grasses.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: The cultural deposits are apparently deflated and entirely surficial, and moderate to severe lateral displacement of the cultural remains has undoubtedly occurred. The site covers a broad area, but artifact density is quite low despite the severity of deflation. The information yield potential of the site is low, and 41KT23 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT24 (Dam Site 10, Survey Unit B-8)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1815 feet/553 meters

Dimensions: 300 meters N-S by 400 meters E-W

Location: At the western extremity of the Dam Site 10 basin, on the northeastern margin of the large salt flat at the head of Short Croton Creek. The site is located 3.4 kilometers west-northwest of the confluence of Croton and Short Croton creeks and 2.3 kilometers southwest of the outlet of Coker Tank.

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Description: Moderately dense to diffuse scatter of cores, flakes, retouched flakes and heat-fractured quartzite. One laterally and distally retouched planoconvex uniface was collected (Appendix III). The debitage is strictly chert and Ogallala quartzite. Visible cultural materials are concentrated on the streamward periphery of the site. Site area is relatively large; no discernible features were noted.

Physiography: Bedrock bench and the adjacent valley margin slope, overlooking and approximately 4 to 5 meters above the salt flat.

Lithology: Resistant gypsum bed of the Whitehorse Group overlain by a shallow mantle of fine sandy loam. Mantle could be weathered sandstone or alluvium.

Soil: Fine sandy loam; mapped as Woodward Series, a Typic Ustochrept; soil in immediate vicinity of site perhaps more accurately classified as a Typic Ustorthent.

Vegetation: Moderate cover of juniper, mesquite, cacti, yucca and various mid grasses.

Condition: Moderately disturbed by gully and sheet erosion.

Remarks: A possible gunflint was recovered from this site. The morphology of this artifact is described in Appendix III.

Assessment: Deflation of the cultural deposit is greatest along its southwestern margins and over the entire northeastern half of the site. However, erosion within the more central parts of the southwestern half of the site is minimal. Given the concentration of burned rocks around the deflated margins of this area, it seems quite likely that intact, shallowly buried hearths may occur. The information yield potential of the site therefore seems moderate to high, and 41KT24 may be eligible for nomination to the National Register of Historic Places.

Recommendations: Excavations of a limited and exploratory nature should be conducted to test for the presence of intact, shallowly buried cultural features near the center of the southwestern half of the site.

### 41KT25 (Dam Site 10, East of Survey Unit B-25)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1815 feet/553 meters

Dimensions: 2 meters N-S by 2.5 meters E-W

Location: In the central portion of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 0.9 kilometer northeast of the confluence of Croton and Short Croton creeks and 3.1 kilometers southeast of the outlet of Coker Tank.

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Description: One discrete concentration of approximately 100 heat-fractured quartz and quartzite cobble fragments, approximately 2 meters in diameter, associated with one cobble tool, a crude biface. The tool was collected and is described in Appendix III. Site area is very small, consisting only of this feature.

Physiography: Valley margin slope, approximately 25 meters above the present Croton Creek channel.

Lithology: Mid to early Holocene strath terrace fill, gravelly very fine sandy loam in texture.

Soil: Obaro gravelly very fine sandy loam, a Typic Ustochrept.

Vegetation: Moderately dense cover of mesquite, prickly pear, threeawn and gramagrass.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: The entire area surrounding the disturbed hearth has been moderately to severely deflated, yet no adjacent cultural materials are visible at the surface. It would appear that the site consists only of a single isolated hearth. Information yield potential is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT26 (Dam Site 10, Survey Unit B-27)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters

Dimensions: 5 meters N-S by 5 meters E-W

Location: In the central portion of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 1.3 kilometers east of the confluence of Croton and Short Croton creeks and 3.7 kilometers southeast of Coker Tank.

Description: Discrete concentration of 15 to 20 large pieces of heat-fractured rocks, 5 meters in diameter, located within the extensive lag gravel concentration recorded as L41KT9. This appears to be a disturbed hearth. No tools or debitage were noted. Site area is very small and consists only of this feature.

Physiography: Canyon rim overlooking Croton Creek, 18 meters above the stream.

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Lithology: Poorly consolidated sandstone of the Whitehorse Group, overlain by a lag concentration of Quaternary alluvial gravels.

Soil: Rough Broken Land mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Grasses and forbs, juniper, mesquite and cacti.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: The entire area surrounding the disturbed hearth has been moderately to severely deflated, yet no adjacent cultural materials are visible at the surface. It is likely that the site consists only of a single isolated hearth. Information yield potential is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

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### 41KG24 (x41KG1; Dam Site 19, Survey Unit B-92)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1555 feet/474 meters

Dimensions: 20 meters NW-SE by 40 meters SW-NE

Location: In the central portion of the Dam Site 19 basin; at the lower end of an unnamed left-bank tributary of North Croton Creek. The site is 5.9 kilometers northwest of the gaging station on North Croton Creek and 6.5 kilometers southwest of the north end of the 6666 Ranch landing strip.

Description: Moderately dense scatter of chipped stone tools, cores and flakes, and heat-fractured rocks. Source material of the lithic specimens was not recorded. The southwestern end of the site exhibits the heaviest concentration of materials; one retouched flake and one biface fragment were observed in this area. Site is of moderate size; no discernible features were noted.

Physiography: Bedrock bench overlooking the confluence of North Croton Creek and a left-bank tributary, 15 meters above the streams.

Lithology: A shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

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Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock is exposed at the surface over much of the site area.

Vegetation: Juniper, hackberry and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site exhibits a moderately high artifact density, the context of the cultural material has been completely destroyed, and the site cannot be considered eligible for nomination to the National Register of Historic Places. However, the cultural material from 41KG24 would provide a useful comparative sample for the study of aboriginal selection and use of lithic raw materials. Given that the present distribution of the cultural materials appears to be largely or entirely attributable to post-depositional disturbance, their collection need not be performed in a controlled manner.

Recommendations: Uncontrolled surface collection of all visible cultural materials.

### 41KG25 (x41KG2; Dam Site 19, Survey Unit B-92)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1560 feet/475 meters

Dimensions: 60 meters NW-SE by 85 meters NE-SW

Location: In the central portion of the Dam Site 19 basin, at the lower end of an unnamed, left-bank tributary of North Croton Creek. The site is 5.9 kilometers northeast of the gaging station on that stream and 6.5 kilometers southeast of the north end of the 6666 Ranch landing strip.

Description: Diffuse scatter of tested cobbles, chipped stone flakes and tools. One dart point base and one distal biface fragment were observed. The debitage is predominantly quartzite. Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking a left-bank tributary of North Croton Creek, 15 meters above the former stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, mesquite and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: It is difficult to be sure, on the basis of the information recorded by the SMU survey crew, but 41KG25 may be a lithic procurement area associated with an outcrop of the 12-to-15-meter North Croton Creek strath terrace. Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG26 (x41KG3; Dam Site 19, Survey Unit B-92)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1550 feet/473 meters

Dimensions: 17 meters N-S by 15 meters E-W

Location: In the central portion of the Dam Site 19 basin, at the lower end of an unnamed, left-bank tributary of North Croton Creek. The site is 5.8 kilometers northwest of the gaging station on that stream and 6.3 kilometers southwest of the north end of the 6666 Ranch landing strip.

Description: Diffuse scatter of chipped stone cores and flakes, and unmodified and heat-fractured quartzite cobbles. The debitage is primarily of chert. Site is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking a left-bank tributary of North Croton Creek, 15 meters above the former stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, mesquite and cacti.

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Condition: Severely disturbed by sheet erosion.

Assessment: As in the case of 41KG25, it is possible that 41KG26 is associated with a remnant of the 12-to-15-meter North Croton Creek strath terrace, but one cannot be sure on the basis of the presently existing documentation. Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The site is relatively small, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of the site is low, and it cannot be considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG27 (x41KG4; Dam Site 19, Survey Unit A-121)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1625 feet/495 meters

Dimensions: 20 meters N-S by 10 meters E-W

Location: In the central portion of the Dam Site 19 basin, at the confluence of Pen Branch and North Croton Creek. The site is 0.35 kilometer southwest of that confluence and 0.4 kilometer northeast of the Pen Branch Tank outfall.

Description: Diffuse scatter of chipped stone tools, cores and flakes of local quartzites. An arrow point, one fragmentary graver and one crude biface were observed. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Pen Branch, at its confluence with North Croton Creek, 40 meters above the streams.

Lithology: Shallow mantle of weathered sandstone overlying dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Juniper, short grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low,

and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG28 (x41KG5; Dam Site 19, Survey Unit A-121)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1620 feet/494 meters

Dimensions: 30 meters N-S by 20 meters E-W

Location: In the central portion of the Dam Site 19 basin, at the confluence of Pen Branch and North Croton Creek. The site is 0.4 kilometer south of that confluence, and 0.4 kilometer east of the Pen Branch Tank outfall.

Description: Diffuse to moderately dense scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. Material reaches its maximum density about the center of the site and tapers off towards its margins. Two fragmentary bifaces and several retouched flakes were observed. Chipped stone tools and debitage are predominantly chert. Site is relatively small; no discernible features were noted.

Physiography: Canyon rim overlooking Pen Branch, at its confluence with North Croton Creek, 42 meters above the elevation of the streams.

Lithology: Shallow mantle of weathered sandstone overlying dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper and short to mid grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The density of cultural material is rather low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered to be eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.



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41KG29 (x41KG6; Dam Site 19, Survey Unit A-121)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1640 feet/500 meters

Dimensions: 20 meters N-S by 20 meters E-W

Location: In the central portion of the Dam Site 19 basin, at the confluence of Pen Branch and North Croton Creek. The site is 0.55 kilometer south of that confluence and 0.45 kilometer east of the outlet of Pen Branch Tank.

Description: Diffuse scatter of chipped stone cores and flakes, and heat-fractured rocks. Two battered cobbles were observed. Quartzite dominates the lithic specimens. Site area is relatively small. No discernible features or artifact concentrations were noted.

Physiography: Upland slope overlooking the confluence of Pen Branch and North Croton Creek, 45 meters above the streams.

Lithology: Shallow mantle of weathered clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, prickly pear and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG30 (x41KG7; Dam Site 19, Survey Unit A-122)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1550 feet/472 meters

Dimensions: 24 meters N-S by 20 meters E-W

Location: In the central portion of the Dam Site 19 basin, along the middle reaches of North Croton Creek. The site is 5.5 kilometers northwest of the gaging station on that stream and 6.5 kilometers southwest of the north end of the 6666 Ranch landing strip.

Description: Diffuse scatter of chipped stone cores and flakes, and heat-fractured rock. Two retouched flakes were observed. Raw material of the specimens are not recorded. Site area is relatively small, and no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking North Croton Creek, 18 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margin of the site area.

Vegetation: Juniper, forbs and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG31 (x41KG8; Dam Site 19, Survey Unit A-116)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1590 feet/485 meters

Dimensions: 35 meters N-S by 20 meters E-W

Location: In the central portion of the Dam Site 19 basin, along the middle reaches of North Croton Creek. The site is 0.95 kilometer northwest of the confluence of Pen Branch and North Croton Creek and 1.15 kilometers northwest of the Pen Branch Tank outfall.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured rock. Lithic materials are entirely of local

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quartzites. Two biface failures and one abraded cobble were observed. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking North Croton Creek, 28 meters above the stream.

Lithology: Shallow mantle of weathered clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Juniper, prickly pear and short grasses.

Condition: Severely disturbed by sheet and rill erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG32 (x41KG9; Dam Site 19, Survey Unit B-119)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1570 feet/479 meters

Dimensions: 60 meters N-S by 14 meters E-W

Location: In the central portion of the Dam Site 19 basin, at the confluence of Pen Branch and North Croton Creek. The site is 0.3 kilometer northwest of the Pen Branch Tank outfall and 0.85 kilometer southwest of the confluence of Pen Branch and North Croton Creek.

Description: Diffuse scatter of chipped stone cores and flakes of chert and quartzite. Site area is rather elongated but small. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Pen Branch, 18 meters above the stream near its confluence with North Croton Creek.

Lithology: Shallow mantle of weathered sandy clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a sandy clay, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out along the streamward margins of the site.

Vegetation: Sparse cover of juniper and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the density of the cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG33 (Dam Site 19, Survey Unit A-191)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1535 feet/468 meters

Dimensions: 5 meters N-S by 10 meters E-W

Location: At the eastern extremity of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 5.1 kilometers northwest of the confluence of North Croton Creek and the Brazos River and 3.5 kilometers northeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone cores and flakes. Debitage is of quartzite. Site area is extremely small. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Bradley Creek, 18 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying conglomerate of the San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Relatively sparse cover of juniper, low grasses and cacti.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated. The site is extremely small, contains perhaps no more than a total of 30 specimens, and further investigations are not

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likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG34 (Dam Site 19, Survey Unit A-191)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1530 feet/466 meters

Dimensions: 50 meters NE-SW by 120 meters NW-SE

Location: At the eastern extremity of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 5.2 kilometers northwest of the confluence of North Croton Creek and the Brazos River and 2.6 kilometers northeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. Cultural materials are somewhat concentrated at the southern end of the site and diminish to the north. Debitage is of quartzite. Site area is relatively large; no discernible features were noted.

Physiography: Bedrock bench overlooking Bradley Creek, 12 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying conglomerate of the San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Sparse cover of juniper, acacia and miscellaneous grasses.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

41KG35 (Dam Site 19, Survey Unit A-121)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1580 feet/482 meters

Dimensions: Isolated find

Location: At the eastern extremity of the Dam Site 19 basin, at the upper end of an unnamed left-bank tributary of North Croton Creek. The site is 7.4 kilometers northwest of the confluence of North Croton Creek and the Brazos River and 3.5 kilometers north of the gaging station on North Croton Creek.

Description: An isolated find of a single quartzite biface fragment (Appendix III: Group 3 Bifaces). No other cultural materials, features or concentrations were noted.

Physiography: Bedrock bench overlooking a left-bank tributary of North Croton Creek, 15 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, croton and threeawn grass.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: The entire area surrounding the site has been severely deflated, yet no cultural materials other than the biface were visible at the surface. It is highly unlikely that any buried cultural materials are present at the site. Information yield potential of the site is low, and it is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

41KG36 (Dam Site 19, Survey Unit A-145)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1555 feet/474 meters

Dimensions: 150 meters N-S by 30 meters E-W

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**Location:** At the eastern end of the Dam Site 19 basin, at the head of a left-bank tributary of North Croton Creek. The site is 3.8 kilometers west of the north end of the 6666 Ranch landing strip and 3.4 kilometers northwest of the gaging station on North Croton Creek.

**Description:** Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartz and quartzite. One biface was collected (Appendix III, Group 1 Biface), and two abraded cobbles were observed. Chipped stone materials are of quartzite and chert. Site area is relatively large; no discernible features or artifact concentrations were noted.

**Physiography:** Two bedrock benches overlooking a left-bank tributary of North Croton Creek, 6 to 9 meters above the stream.

**Lithology:** Shallow mantle of weathered shale overlying dolomite of the Blaine Formation.

**Soil:** Owen clay loam, a Lithic Ustochrept. Dolomite bedrock crops out along the streamward margins of the site area.

**Vegetation:** Sparse cover of juniper, prickly pear, grasses and forbs.

**Condition:** Subsequent to brush clearing by heavy machinery, the site has been severely disturbed by sheet and gully erosion.

**Assessment:** Surface indications suggest that the cultural deposits are largely or completely deflated and have suffered moderate to severe lateral displacement. Although the site is rather large, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of this site is low, and it is not considered to be eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41KG37 (Dam Site 19, Survey Unit A-145)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1550 feet/473 meters

**Dimensions:** 20 meters N-S by 25 meters E-W

**Location:** At the eastern end of the Dam Site 19 basin, at the head of an unnamed left-bank tributary of North Croton Creek. The site is 3.2 kilometers northwest of the gaging station on North Croton Creek and 3.85 kilometers west of the north end of the 6666 Ranch landing strip.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite and sandstone. One biface manufacturing failure was collected (Appendix III, Group 2 Bifaces). Debitage is primarily of quartzite. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking a left-bank tributary of North Croton Creek, 6 meters above the stream.

Lithology: Shallow mantle of weathered shale overlying dolomite of the Blaine Formation.

Soil: Owens clay loam, a Lithic Ustochrept. Dolomite bedrock crops out along the streamward margin of the site area.

Vegetation: Sparse cover of juniper, broomweed, grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG38 (Dam Site 19, Survey Unit A-190)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1540 feet/469 meters

Dimensions: At least 34 meters NE-SW by 25 meters NW-SE

Location: At the eastern end of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 3.35 kilometers northwest of the confluence of North Croton Creek and the Brazos River and 3 kilometers northeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured rocks, associated with at least 13 probable hearths. The latter features are individually described in Table 24. There is no regular spacing between the hearths, but the features are most numerous in the western (streamward) portion of the site. Two re-touched flakes and eight abraded cobbles and cobble fragments were observed in feature context. The heat-fractured rock is primarily quartzite, but some burned dolomite and shale also occur. Thedebitage is predominantly chert. Additional features may be buried to the immediate northeast of the known site area; see Assessment.



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TABLE 24  
FEATURE DESCRIPTIONS, 41KG38

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F-1: Dimensions: 45 centimeters N-S by 30 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 1 abraded quartzite cobble fragment (unburned); and 3 chert flakes (unburned).

F-2: Dimensions: 38 centimeters N-S by 30 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 1 silicified wood fragment (unburned); 1 retouched chert flake (unburned); 3 abraded quartzite cobble fragments (unburned).

F-3: Dimensions: 60 centimeters in diameter

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 3 chert flakes (unburned).

F-4: Dimensions: 35 centimeters N-S by 50 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 2 chert flakes (unburned); 2 abraded quartzite cobble fragments (unburned).

F-5: Dimensions: 40 centimeters N-S by 50 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 5 chert flakes (one with edge retouch; all burned).

F-6: Dimensions: 25 centimeters N-S by 20 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 1 chert flake (unburned); 1 abraded quartzite cobble (unburned).

F-7: Dimensions: 80 centimeters N-S by 110 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; heat-fractured red shale fragments; 1 chert flake (unburned).

F-8: Dimensions: 45 centimeters N-S by 140 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; heat-fractured dolomite fragments.

TABLE 24, continued

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F-9: Dimensions: 45 centimeters N-S by 140 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; heat-fractured dolomite fragments.

F-10: Dimensions: 50 centimeters N-S by 100 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 1 silicified wood fragment (unburned); 1 chert flake (unburned); 1 abraded quartzite cobble fragment (unburned).

F-11: Dimensions: 35 centimeters N-S by 75 meters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; heat-fractured red shale fragments.

F-12: Dimensions: 100 centimeters N-S by 50 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; heat-fractured dolomite and shale fragments; 2 chert cobbles (unburned); 1 chert flake (unburned).

F-13: Dimensions: 30 centimeters N-S by 20 centimeters E-W

Contents: Heat-fractured, gray and purple, fine-grained quartzite cobble fragments; 1 chert flake (unburned).

NOTE: Much of the variation in dimensions of the features is attributable to erosion-related displacement. The broadest features are also the most diffuse and are clearly disturbed. Most of the features were probably 30 to 40 centimeters in diameter and roughly circular prior to deflation.

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Physiography: Bedrock bench overlooking Bradley Creek, 6 meters above the stream.

Lithology: Moderately shallow mantle of weathered sandy shale overlying sandstone of the San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Lithic Ustorthent.

Vegetation: Moderate to sparse cover of mesquite, juniper, cat-claw, featherplume, prickly pear and short grasses.

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Condition: The known site area has been moderately to severely disturbed by sheet and rill erosion.

Assessment: Although all of the known site area has been deflated by erosion, there is a relatively undisturbed area of soil to the immediate northeast. An abrupt erosional scarp, approximately 15 to 20 centimeters high, separates the two. Within the known site, cultural material and deflated features were observed adjacent to this scarp. It is highly likely that additional, intact features lie buried 15 to 20 centimeters below the surface to the immediate northeast of the known site area. Information yield potential of the site seems high, and 41KG38 may be eligible for nomination to the National Register of Historic Places.

Recommendations: The exposed cultural features should be carefully mapped (only a compass and pace map was prepared by the present survey), individually documented, and their contents separately collected. Excavations of a limited, exploratory nature should be conducted to the immediate northeast of the known site area to test for the presence of intact, shallowly buried cultural features.

### 41KG39 (Dam Site 19, Survey Unit A-190)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1530 feet/466 meters

Dimensions: 3 meters N-S by 10 meters E-W

Location: At the eastern extremity of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 5.22 kilometers northwest of the confluence of Bradley Creek and the Brazos River and 2.91 kilometers northeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chert flakes and heat-fractured quartzite. Site is very small and consists of a single concentration of artifacts. No features were noted.

Physiography: Bedrock bench overlooking Bradley Creek, 5 meters above the stream.

Lithology: Weathered shale overlying sandstone of the San Angelo Formation.

Soil: The site surface has been deflated into bedrock by gully erosion. There is no soil in the immediate site area.

Vegetation: Sparse cover of juniper and short grasses.

Condition: Severely disturbed by gully erosion.

Assessment: The site has been virtually destroyed by erosion. All of the material is distributed along the lower walls and floor of a gully which has incised into Permian bedrock. There is no evidence of additional, intact remains in the immediate vicinity. The site is extremely small and comprises a total of only eight specimens. Its information yield potential is low, and 41KG39 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG40 (Dam Site 19, Survey Unit B-141)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1580 feet/482 meters

Dimensions: Isolated find

Location: At the eastern extremity of the Dam Site 19 basin, along the upper reaches of Bradley Creek. The site is 3.9 kilometers north-east of the gaging station on North Croton Creek and 5.64 kilometers northwest of the confluence of North Croton Creek and the Brazos River.

Description: An isolated find of a single chert dart point. No other cultural material was noted. The specimen is classifiable as type Nolan; see Appendix III.

Physiography: Bedrock bench overlooking Bradley Creek, 12 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a calcareous sandy loam, classifiable as a Lithic Ustorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, prickly pear, yucca and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: The entire area surrounding the site has been severely deflated, yet no cultural material other than the dart point was visible at the surface. It is highly unlikely that any buried cultural materials are present at the site. Information yield potential is low, and 41KG40 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

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### 41KG41 (Dam Site 19, Survey Unit B-138)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1600 feet/488 meters

Dimensions: 5 meters N-S by 4 meters E-W

Location: At the eastern extremity of the Dam Site 19 basin, along the upper reaches of Bradley Creek. The site is 4.4 kilometers north-east of the gaging station on North Croton Creek and 0.6 kilometer northeast of the north end of the 6666 Ranch landing strip.

Description: Diffuse scatter of chipped stone tools, cores and flakes. A biface and a planoconvex uniface with lateral and distal re-touch were collected (Appendix III). Debitage is primarily of chert. Site area is very small; no visible concentrations or features were noted.

Physiography: Bedrock bench overlooking Bradley Creek, 9 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, prickly pear and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits at 41KG41 are completely deflated. The site is extremely small, and the density of cultural material is quite low. Further investigations are not likely to produce additional significant data. The information yield potential of the site is low, and it is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG42 (Dam Site 19, Survey Unit B-85)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1565 feet/477 meters

Dimensions: 150 meters N-S by 100 meters E-W

**Location:** In the central portion of the Dam Site 19 basin, along the lower reaches of an unnamed left-bank tributary of North Croton Creek. The site is 2 kilometers northwest of the junction of Pen Branch and North Croton Creek and 2.4 kilometers north of the outlet of Pen Branch Tank.

**Description:** Diffuse scatter of chipped stone tools, flakes and cores, ground stone tools and heat-fractured quartzite. An edge-damaged flake was collected (Appendix III), and one battered cobble and one abraded cobble were noted. Debitage is primarily quartzite. Cultural materials were concentrated in the eastern portion of the site. Site area is relatively large; no visible features were noted.

**Physiography:** Bedrock bench overlooking a left-bank tributary of North Croton Creek 15 meters above the stream.

**Lithology:** Shallow mantle of weathered shaly clay overlying dolomite of the Blaine Formation.

**Soil:** Owens clay loam, a Lithic Ustochrept.

**Vegetation:** Sparse cover of juniper, mesquite, broomweed, threeawn and featherplume.

**Condition:** Severely disturbed by sheet erosion.

**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. Although the site is rather large, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

41KG44 (Dam Site 19, Survey Unit A-131)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1550 feet/472 meters

**Dimensions:** 10 meters N-S by 10 meters E-W

**Location:** In the central portion of the Dam Site 19 basin, along the middle reaches of North Croton Creek. The site is 4.05 kilometers northwest of the gaging station on North Croton Creek and 5.4 kilometers west of the north end of the 6666 Ranch landing strip.

**Description:** Four heat-fractured quartzite fragments and one chert flake were observed within an area roughly 10 meters in diameter.

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Physiography: Canyon rim above North Croton Creek, 18 meters above the stream.

Lithology: Poorly consolidated sandstone of the Blaine Formation overlain by a lag veneer of Quaternary stream-rolled gravels.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Typic Ustorthent.

Vegetation: Sparse cover of mesquite, short grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated. The site is very small, and the density of cultural material is extremely low. Further investigations are not likely to produce additional significant data. The information yield potential of 41KG44 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

### 41KG45 (Dam Site 14, Survey Unit B-63)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1705 feet/520 meters

Dimensions: 37 meters N-S by 15 meters E-W

Location: In the northeastern portion of the Dam Site 14 basin, along the lower reaches of Southerland Canyon. The site is 2.4 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek and 1.75 kilometers east of the gaging station at the confluence of Salt Croton and Haystack creeks.

Description: Diffuse scatter of heat-fractured quartzite fragments, associated with a small quantity of debitage and the remains of one largely intact hearth. The hearth is approximately 2 meters in diameter and contains 40 to 50 fragments of heat-fractured quartzite. The observed debitage comprises 10 chert flakes, two of which are edge damaged.

Physiography: Bedrock bench overlooking Southerland Creek, 4 meters above the stream.

Lithology: Shallow mantle of fine sandy alluvium of Quaternary age overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock is exposed over much of the site area.

Vegetation: Sparse cover of juniper, featherplume and scattered grasses.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement over most of the site area. Only one fairly intact feature was observed, and it is highly unlikely that additional buried cultural features remain to be found at the site. The site is fairly small, and the density of cultural material is quite low. Further investigations are not likely to produce additional significant data. Thus, the information yield potential of 41KG45 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG46 (Dam Site 14, Survey Unit B-55)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1700 feet/518 meters

Dimensions: 50 meters N-S by 25 meters E-W

Location: At the northwestern extremity of the Dam Site 14 basin, along the middle reaches of Haystack Canyon. The site is 2.5 kilometers northwest of the gaging station at the confluence of Haystack and Salt Croton creeks and 5.75 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

Description: Diffuse scatter of chipped stone cores and flakes. Debitage is predominantly of quartzite, with some chert also present. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking Haystack Creek, 6 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out in places within the site.



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Vegetation: Sparse cover of juniper, mesquite, yucca, prickly pear, featherplume, agarita and mormon tea.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is moderately large, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of the site is low, and 41KG46 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG47 (Dam Site 14, Survey Unit B-60)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1740 feet/530 meters

Dimensions: 100 meters N-S by 150 meters E-W

Location: In the northwestern portion of the Dam Site 14 basin, at the lower end of Haystack Creek. The site is 0.7 kilometers northwest of the gaging station at the confluence of Haystack and Salt Croton creeks and 4 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

Description: Diffuse scatter of chipped stone cores and flakes, and heat-fractured quartzite. Cores are of Ogallala quartzite, flakes of chert. Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Haystack Creek, 24 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderate cover of juniper, mesquite, agarita, tasajillo, prickly pear, wolfberry, sumac, mormon tea and short grasses.

Condition: Minor sheet erosion has occurred, but the soil of the site area appears to be relatively intact.

Assessment: Although the presently visible density of cultural material is low, 41KG47 is a large site and appears to have suffered

little erosion. It is highly likely that the apparent artifact density is deceptively low, and intact features may well be buried within the site. As noted above, the soil is quite shallow, and any features present will probably be found within 25 centimeters of the surface. The information yield potential of 41KG47 seems high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: Excavations of a limited and exploratory nature should be conducted to test for the presence of intact, shallowly buried cultural remains.

41KG48 (Dam Site 14, Survey Unit B-59)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1670-1720 feet/509-524 meters

Dimensions: 175 meters N-S by 150 meters E-W

Location: In the northwestern portion of the Dam Site 19 basin, at the lower end of Haystack Creek. The site is 1.1 kilometers northwest of the gaging station at the junction of Haystack and Salt Croton creeks and 4.4 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

Description: Diffuse scatter of chipped stone tools, cores and flakes, ground stone tool fragments and heat-fractured quartzite. Chipped stone tools and debitage are primarily of chert and Ogallala quartzite. One biface, one planoconvex uniface with lateral retouch, and two retouched flakes were collected (Appendix III). Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim and two subjacent bedrock benches overlooking Haystack Creek, 6 to 12 meters above the stream.

Lithology: Interbedded gypsum and poorly consolidated sandstone of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Where present, the soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Much of the site rests on exposed gypsum bedrock.

Vegetation: Dense cover of juniper, mesquite, yucca, sumac and various grasses and forbs.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is rather large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG48 is low,

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

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and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG49 (Dam Site 14, Survey Unit B-59)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1690 feet/515 meters

Dimensions: 100 meters N-S by 50 meters E-W

Location: In the northwestern portion of the Dam Site 14 basin, at the lower end of Haystack Canyon. The site is 0.8 kilometer northwest of the gaging station at the confluence of Haystack and Salt Croton creeks and 2.5 kilometers north of the confluence of Salt Flat and Salt Croton creeks.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartz and quartzite. One dart point (possibly type Marshall), one biface and one edge-damaged flake were collected (Appendix III); mussel shell was noted. Debitage is of quartzite, chert and petrified wood. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking Haystack Creek, 6 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Juniper, yucca, featherplume, sumac, agarita, grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG49 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG50 (Dam Site 14, Survey Unit A-72)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1680 feet/512 meters

Dimensions: 1100 meters N-S by 50 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The center of the site is 0.7 kilometer southwest of the gaging station at the confluence of Salt Croton and Haystack creeks and 3.55 kilometers northwest of the confluence of Salt Croton Creek and Bitter Gulch.

Description: Extensive, diffuse scatter of chipped stone cores and flakes and heat-fractured rock fragments in association with a dense lag concentration of stream-rolled gravels. No features or artifact concentrations were noted. The material appears to be in a secondary depositional context; see Assessment.

Physiography: The deposit is eroding from the base of a shallow, recent fill terrace, 1 to 3 meters above the present channel of Salt Croton Creek.

Lithology: Recent alluvium of Salt Croton and Haystack creeks, incorporating redeposited gravels of earlier, higher terraces. See discussion of Dam Site 14 terraces in Appendix V. Alluvium is a gravelly fine sandy loam in texture.

Soil: Yomont gravelly fine sandy loam, a Typic Ustifluvent.

Vegetation: Sparse cover of juniper, yucca, prickly pear, agarita, sumac, thistles, mesquite, grass and forbs.

Condition: The terrace from which the material derives is being eroded by the lateral migration of Salt Croton Creek. The visible cultural material forms a lag concentration immediately alongside the creek channel where the overlying terrace fill has been completely scoured away.

Assessment: As is discussed in greater detail in Appendix V, the terrace from which the materials exposed at 41KG50 are eroding is almost certainly of very recent origin, probably dating within the last century. The articulated skeleton of a modern domesticated cow was observed eroding from the base of this terrace. Thus, it is virtually certain that the cultural material exposed at 41KG50 is in secondary context, and the deposit would perhaps have been more properly recorded as a locality. The information yield potential of 41KG50 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

### 41KG51 (Dam Site 19, Survey Unit B-76)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1580 feet/482 meters

Dimensions: 25 meters N-S by 25 meters E-W

Location: In the northwestern portion of the Dam Site 19 basin, at the lower end of an intermittent left-bank tributary of North Croton Creek. The site is 3.75 kilometers northwest of the confluence of Pen Branch and North Croton Creek and 3.9 kilometers northwest of the outlet of Pen Branch Tank.

Description: Diffuse scatter of chipped stone tools and flakes, heat-fractured quartz and quartzite, and ground stone tool fragments. One laterally retouched flake and two edge-damaged flakes were collected (Appendix III). Debitage is of chert and quartzite. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking North Croton Creek, 18 meters above the stream.

Lithology: Shallow mantle of loam overlying dolomite of the Blaine Formation.

Soil: Cottonwood loam, a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, sumac, broomweed, grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits at 41KG51 are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG51 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG52 (Dam Site 19, Survey Unit B-75)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1585 feet/483 meters

Dimensions: 100 meters N-S by 50 meters E-W

Location: In the northwestern portion of the Dam Site 19 basin, at the lower end of an intermittent left-bank tributary of North Croton Creek. The site is 3.6 kilometers northwest of the confluence of Pen Branch and North Croton Creek and 3.75 kilometers northwest of the outlet of Pen Branch Tank.

Description: Diffuse scatter of chipped stone tools and flakes and heat-fractured quartz and quartzite. Debitage is of quartzite, quartz and chert. One dart point fragment, one biface, and one laterally re-touched flake were collected (Appendix III). Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Two bedrock benches overlooking North Croton Creek, 12 to 15 meters above the stream.

Lithology: Shallow mantle of calcareous clay loam overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent, with dolomite bedrock exposed over much of the site area.

Vegetation: Sparse cover of juniper, sumac, broomweed, prickly pear, featherplume, grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is moderately large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG53 (Dam Site 19, Survey Unit B-80)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1600 feet/488 meters

Dimensions: 100 meters N-S by 50 meters E-W

Location: In the northwestern portion of the Dam Site 19 basin, at the head of an intermittent left-bank tributary of North Croton Creek. The site is 4.6 kilometers north of the confluence of Pen Branch and North Croton Creek and 5 kilometers north of the outlet of Pen Branch Tank.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Description: Diffuse scatter of chipped stone cores and flakes and heat-fractured quartz and quartzite. Debitage is primarily of quartzite. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking a left-bank tributary of North Croton Creek, 9 meters above the stream.

Lithology: Shallow mantle of calcareous clay loam overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent, with dolomite bedrock exposed over much of the site area.

Vegetation: Moderate cover of juniper, mesquite, sumac, thistle, prickly pear, grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is moderately large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG53 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG54 (Dam Site 19, Survey Unit B-104)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1580 feet/482 meters

Dimensions: 40 meters N-S by 20 meters E-W

Location: At the western extremity of the Dam Site 19 basin, along the lower reaches of Pen Branch. The site is 3.7 kilometers west of the confluence of Pen Branch and North Croton Creek and 3.35 kilometers northwest of the outlet of Pen Branch Tank.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. Debitage is of chert and quartzite. A dart point fragment and a biface fragment were collected (Appendix III). No discernible features or artifact concentrations were noted.

Physiography: Valley margin slope overlooking a small left-bank tributary of Pen Branch, 4 meters above the former stream.

Lithology: Shallow mantle of loam overlying dolomite of the Blaine Formation.

Soil: Cottonwood loam, a Lithic Torriorthent, with dolomite bedrock exposed over much of the site area.

Vegetation: Sparse cover of juniper, mesquite, catclaw and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG54 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG55 (Dam Site 19, Survey Unit B-104)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1600 feet/488 meters

Dimensions: 50 meters N-S by 25 meters E-W

Location: At the western extremity of the Dam Site 19 basin, along the lower reaches of Pen Branch. The site is 3.75 kilometers west of the confluence of Pen Branch and North Croton Creek and 3.3 kilometers northwest of the outlet of the Pen Branch Tank.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite and dolomite. Debitage is of quartz and quartzite. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking a small left-bank tributary of Pen Branch, 6 meters above the former stream.

Lithology: Shallow mantle of loamy clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent, with dolomite bedrock exposed over much of the site area.

Vegetation: Sparse cover of juniper, grasses, sumac, broomweed and forbs.



## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is of moderate size, but the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The site exhibits a low information yield potential and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG58 (Dam Site 19, Survey Unit A-104)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1620 feet/494 meters

Dimensions: 50 meters N-S by 150 meters E-W

Location: In the northwestern portion of the Dam Site 19 basin, along the middle reaches of North Croton Creek. The site is 5 kilometers northwest of the confluence of Pen Branch and North Croton Creek and 5.15 kilometers northwest of the outlet of Pen Branch Tank.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite and dolomite. Debitage is of chert and quartzite. One dart point, classifiable as type Edgewood, was collected (Appendix III). Cultural materials are concentrated in the southern portion of the site and diminish toward the north. Site area is of moderate size; no discernible features were noted.

Physiography: Bedrock bench overlooking North Croton Creek, 24 to 26 meters above the stream.

Lithology: Shallow mantle of calcareous clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood clay loam, a Lithic Ustorthent, with dolomite bedrock exposed over much of the site area.

Vegetation: Sparse cover of juniper, mesquite, sumac, agarita, grasses and forbs.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is rather large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41KG58 is low,

and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG59 (Dam Site 19, Survey Unit A-104)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1580 feet/482 meters

Dimensions: Isolated find

Location: In the northwestern portion of the Dam Site 19 basin, along the middle reaches of North Croton Creek. The site is 4.9 kilometers northwest of the confluence of Pen Branch and North Croton Creek and 4.95 kilometers northwest of the outlet of Pen Branch Tank.

Description: Isolated find of a single chert dart point, classifiable as type Gower (Appendix III), associated with a diffuse concentration of unmodified quartz, quartzite and chert gravels. No cultural material other than the dart point was observed.

Physiography: Bedrock bench overlooking North Croton Creek, 12 meters above the stream.

Lithology: Approximately 75 centimeters of calcareous clay overlying dolomite of the Blaine Formation. A lag concentration of Quaternary gravels caps the Permian bedrock.

Soil: Owens gravelly clay loam, a Typic Ustochrept.

Vegetation: Sparse cover of grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: The gravels at 41KG59 undoubtedly relate to the 12-to-15-meter North Croton Creek strath terrace (Appendix V). The entire area surrounding the site has been severely deflated, yet no cultural materials other than the dart point were visible at the surface. It is highly unlikely that any buried cultural remains are present at the site. Its information yield potential is low, and 41KG59 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

41KG62 (Dam Site 14, Outside survey area)

USGS Quadrangle: 7.5' Southerland Canyon 1958

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Elevation: 1765 feet/538 meters

Dimensions: 30 meters N-S by 15 meters E-W

Location: Above the northern end of the Dam Site 14 basin, along the middle reaches of Haystack Canyon. The site is 4.75 kilometers south of the Bar S Ranch headquarters and 6.2 kilometers east of Hackberry Windmill.

Description: Moderately dense scatter of chert and quartzite flakes, heat-fractured quartzite cobble fragments, and abraded quartzite cobbles. One concentration of heat-fractured quartzite, approximately 40 centimeters in diameter, was noted on the southern end of the site.

Physiography: Valley margin slope overlooking Haystack Creek, 17 meters above the stream.

Lithology: Poorly consolidated sandstone of the Whitehorse Group.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Sparse cover of mesquite, juniper, yucca, prickly pear, various annual forbs and short grasses.

Condition: Moderately to severely disturbed by sheet and rill erosion.

Assessment: Surface indications suggest that the cultural deposits have been largely or entirely deflated and have suffered moderate to severe lateral displacement. Although the site exhibits a moderately high density of cultural material, it is relatively small in area, and the context of the material has been largely destroyed by erosion. The information yield potential of 41KG62 is low, and the site is not considered eligible for nomination to the National Register of Historic Places. The site lies 500 meters upstream of the proposed floodpool and should not be damaged by reservoir construction.

Recommendations: Further work is felt not to be scientifically productive at this time.

### STONEWALL COUNTY SITES

41SN3 (x41SN1; Dam Site 19, Survey Unit A-164)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1510 feet/460 meters

Dimensions: 5 meters N-S by 20 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Wedington Creek. The site is .4 kilometer south of the gaging station on North Croton Creek and .85 kilometer southwest of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone cores, flakes, re-touched flakes and heat-fractured quartzite. Chipped stone materials are predominantly chert, but some quartzite also occurs. Three small concentrations of burned rock, probably the remains of disturbed hearths, were observed by the SMU survey crew in 1973. One such concentration was still visible at the time of the present survey.

Physiography: Canyon rim overlooking Wedington Creek, 18 to 20 meters above the stream, near its confluence with North Croton Creek.

Lithology: Poorly consolidated sandstone, San Angelo Formation.

Soil: Owens-Badlands Association mapping unit. Soil of immediate site area is a fine sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Sparse ground cover of juniper, mesquite and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. At least three hearths were present at one time, but two have been destroyed by recent erosion, and the third is severely disturbed. It is unlikely that any additional cultural remains lie buried within 41SN3. The site is quite small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN3 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN4 (x41SN2; Dam Site 19, Survey Unit A-164)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1500 feet/457 meters

Dimensions: 60 meters N-S by 60 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Wedington Creek. The site is 0.5 kilometer southwest of the gaging station on North Croton Creek and 1 kilometer southwest of the confluence of Smelter Canyon and North Croton Creek.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Description: Moderately dense scatter of chipped stone cores, flakes, retouched flakes and heat-fractured quartzite. The SMU survey crew noted 12 concentrations of heat-fractured rock and debitage, probably the remains of hearths. The individual dimensions and contents of the features were not recorded. The site was not revisited by the present survey.

Physiography: Canyon rim overlooking Wedington Creek, 18 to 20 meters above the stream, near its confluence with North Croton Creek.

Lithology: Poorly consolidated sandstone, San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Sparse cover of juniper, grasses and forbs.

Condition: Moderately disturbed by sheet erosion.

Assessment: It is not possible to determine, on the basis of the documentation provided by SMU, whether additional cultural features may lie shallowly buried immediately upslope (south) of the known site area. Experience with similar sites in the area suggests that this is very likely. However, the SMU survey form indicates that even the exposed site area, though deflated, has suffered only minor lateral displacement. It is not possible to definitively assess 41SN4 on the basis of the existing data, but it would appear that the information yield potential may be moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: The site should be revisited and reassessed during the course of the final inventory survey. If the exposed site area has suffered only minor lateral displacement, the features should be mapped and their contents individually collected. If it seems likely that additional buried remains exist adjacent to the site, excavations of a limited and exploratory nature should be conducted to investigate that possibility.

### 41SN5 (x41SN3; Dam Site 19, Survey Unit B-189)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1510 feet/460 meters

Dimensions: 15 meters N-S by 15 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Wedington Creek. The site is 0.7 kilometer southwest of the gaging station on North Croton Creek and 1.2 kilometers southwest of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone cores and flakes, associated with three small concentrations of heat-fractured quartzite.

The debitage is predominantly chert. The dimensions and contents of the features, presumably deflated hearths, were not recorded by the SMU survey crew. The site was not revisited by the present survey.

Physiography: Canyon rim overlooking Wedington Creek, 18 to 20 meters above the stream, near its confluence with North Croton Creek.

Lithology: Poorly consolidated sandstone, San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of immediate site area is a sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Not recorded.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: The documentation provided by SMU suggests that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The three hearths noted appear to have been badly disturbed, and it is very unlikely that any additional, shallowly buried cultural remains are present. Further investigations are not likely to produce additional significant data. The information yield potential of 41SN5 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN6 (x41SN4; Dam Site 19, Survey Unit B-187)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1540 feet/469 meters

Dimensions: 16 meters N-S by 22 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Wedington Creek. The site is 0.7 kilometer southwest of the gaging station on North Croton Creek and 1.2 kilometers southwest of the confluence of Smelter Canyon and North Croton Creek.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. Debitage is primarily quartzite with some chert. One dart point blade fragment and a retouched flake were observed. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Upland slope overlooking the confluence of Wedington and North Croton creeks, 22 meters above the streams.

Lithology: Poorly consolidated sandstone, San Angelo Formation.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Juniper, small shrubs and grasses.

Condition: Severely deflated by sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is quite small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN6 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN7 (x41SN5; Dam Site 19, Survey Unit A-180)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1520 feet/463 meters

Dimensions: 49 meters N-S by 5 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Smelter Canyon. The site is 0.55 kilometer southeast of the confluence of Smelter and North Croton creeks and 1.1 kilometers southeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone cores and flakes, mostly of quartzite. Site area is relatively elongated. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Smelter Creek, 18 meters above the stream, near its confluence with North Croton Creek.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Junipers, sparse grasses and shrubs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN7 is low, and the

site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN8 (x41SN6; Dam Site 19, Survey Unit A-179)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1505 feet/459 meters

Dimensions: 60 meters N-S by 37 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the lower end of Smelter Canyon. The site is 0.45 kilometer southeast of the confluence of Smelter and North Croton creeks and 1.05 kilometers southeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. Five broad concentrations of material were observed by the SMU survey crew; presumably these represent the remains of severely disturbed hearths. A scraper was observed in one of the concentrations. Site area is of moderate size.

Physiography: Canyon rim overlooking Smelter Creek, 18 meters above the stream, near its confluence with North Croton Creek.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Sandstone bed-rock crops out over much of the site area.

Vegetation: Juniper, shrubs and grasses.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The five cultural features noted by the SMU survey crew were severely disturbed, and it is highly unlikely that any additional, shallowly buried cultural remains are present. The site is of moderate size, but the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN8 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.



## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

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### 41SN9 (x41SN7; Dam Site 19, Survey Unit A-179)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1540 feet/469 meters

Dimensions: 9 meters N-S by 13 meters E-W

Location: In the eastern area of the Dam Site 19 basin, at the lower end of Smelter Canyon. The site is 0.55 kilometer southeast of the confluence of Smelter and North Croton creeks and 1.1 kilometers southwest of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone cores, flakes, heat-fractured quartzite and one ground stone tool. One broad concentration of heat-fractured quartzite, probably the remains of a severely disturbed hearth, was noted by the SMU survey crew. One abraded quartzite cobble was also observed. Site area is relatively small.

Physiography: Canyon rim overlooking Smelter Creek, 18 meters above the stream, near its confluence with North Croton Creek.

Lithology: Shallow mantle of weathered sandstone overlying dolomite of the Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock is exposed over much of the site area.

Vegetation: Juniper and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The single cultural feature observed by the SMU survey crew was severely disturbed, and it is highly unlikely that any additional, shallowly buried cultural remains are present. The site is quite small, its density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN9 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN10 (x41SN8; Dam Site 10, Survey Unit B-44)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800 feet/549 meters

Dimensions: 40 meters N-S by 7 meters E-W

Location: At the eastern extremity of the Dam Site 10 basin, at the lower end of Salt Creek. The site is 1.15 kilometers southwest of Twin Windmills and 0.6 kilometer southwest of the confluence of Salt and Croton creeks.

Description: Diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. The density of cultural material is slightly higher on the southern end of the site. The remains of a severely disturbed hearth were noted on the northern end of the site by the SMU survey crew. Two retouched flakes were observed on the southern end of the site. Site area is relatively small.

Physiography: Upland slope overlooking the confluence of Salt and Croton creeks, 30 meters above the streams.

Lithology: Shallow mantle of weathered sandstone underlain by gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock is exposed at the surface over much of the site area.

Vegetation: Juniper, short grasses, cacti and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The single observed feature was severely disturbed, and it is highly unlikely that any additional, shallowly buried cultural remains are present. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN10 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN11 (x41SN9; Dam Site 10, Survey Unit B-44)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1760 feet/536 meters

Dimensions: 23 meters N-S by 7 meters E-W

Location: At the eastern extremity of the Dam Site 10 basin, at the lower end of Salt Creek. The site is 0.6 kilometer southwest of the

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

confluence of Salt and Croton creeks and 1.1 kilometers southwest of Twin Windmills.

Description: Diffuse scatter of chipped stone cores and flakes. One retouched chert flake was observed. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Salt Creek, 12 meters above the stream, near its confluence with Croton Creek.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex. Soil of the immediate site area is a fine sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Cactus, mesquite and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is quite small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of the site is low, and 41SN11 is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN12 (x41SN10; Dam Site 10, Survey Unit A-45)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800 feet/549 meters

Dimensions: 100 meters N-S by 70 meters E-W

Location: In the northeastern portion of the Dam Site 10 basin, at the lower end of an unnamed left-bank tributary of Croton Creek. The site is 4.5 kilometers west of Starcher Windmill and 3.2 kilometers northwest of Twin Windmills.

Description: Dense scatter of chipped stone cores and flakes in association with a broad lag concentration of gravels. Debitage is primarily quartzite with minor amounts of chert. Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking the confluence of Croton Creek and one of its major left-bank tributaries, 18 meters above the streams.

**Lithology:** Shallow mantle of weathered sandstone overlying gypsum of the Whitehorse Group. A fairly dense concentration of Quaternary gravels caps the Permian bedrock; these apparently have washed downslope onto 41SN12 from the high Croton Creek strath terrace remnant recorded as L41SN35.

**Soil:** Quinlan-Rough Broken Land mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

**Vegetation:** Juniper, mesquite, cactus, grasses.

**Condition:** Severely disturbed by sheet erosion.

**Assessment:** The site appears to be an aboriginal lithic procurement area. Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is rather large and exhibits a high density of cultural material, the context of the deposits has been destroyed, and 41SN12 cannot be considered eligible for nomination to the National Register of Historic Places. However, the cultural material at the site would provide an easily extractable comparative sample suitable for use in studies of aboriginal lithic material exploitation.

**Recommendation:** It is suggested that representative samples of both modified and unmodified lithic materials be collected. The volume of material present at 41SN12 will probably preclude a collection of all visible cultural materials.

41SN13 (x41SN11; Dam Site 10, Survey Unit A-53)

**USGS Quadrangle:** 7.5' Seven Diamond L Canyon 1958

**Elevation:** 1780 feet/543 meters

**Dimensions:** 40 meters N-S by 20 meters E-W

**Location:** At the eastern end of the Dam Site 10 basin, along the lower reaches of Croton Creek. The site is 1.75 kilometers northwest of Twin Windmills and 3.55 kilometers southwest of Starcher Windmill.

**Description:** Diffuse scatter of chipped stone tools, cores and flakes occurring within redeposited lag gravels. Debitage is primarily quartzite with a little chert. Site area is of moderate size; no discernible features or artifact concentrations were noted.

**Physiography:** Bedrock bench overlooking Croton Creek, 20 meters above the stream.

**Lithology:** Shallow mantle of weathered sandstone overlying gypsum of the Whitehorse Group. A fairly dense concentration of Quaternary gravels, recorded as L41SN41, caps the Permian bedrock over a broad area

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surrounding 41SN13; these apparently have washed downslope from a remnant of the high Croton Creek strath terrace.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, short grasses, thistles, prickly pear and tasajillo.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN13 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN14 (x41SN12; Dam Site 10, Survey Unit B-50)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1760 feet/536 meters

Dimensions: 10 meters N-S by 30 meters E-W

Location: At the eastern extremity of the Dam Site 10 basin, along the lower reaches of Croton Creek. The site is 2.5 kilometers southwest of Starcher Windmill and 1.15 kilometers northwest of Twin Windmills.

Description: Diffuse scatter of chipped stone cores, flakes and retouched flakes. Density of cultural material is somewhat higher near the center of the site decreasing toward its margins. There are probably no more than 100 specimens within the entire site. Site area is relatively small; no discernible features were noted.

Physiography: Bedrock bench overlooking a small left-bank tributary of Croton Creek, 20 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Sparse cover of mesquite and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN14 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN15 (x41SN13; Dam Site 14, Survey Unit A-78)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1700 feet/518 meters

Dimensions: 75 meters N-S by 175 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 2.25 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek and 0.8 kilometer northwest of the confluence of Southerland and Salt Croton creeks.

Description: Dense scatter of chipped stone cores, flakes, re-touched flakes and heat-fractured quartzite. Debitage is primarily chert with some quartzite. Multiple concentrations of burned rock were noted by the SMU survey crew in 1973; presumably these represent hearths. The number of such features present was not recorded, and the features were neither mapped nor individually documented. The site was not revisited by the present survey.

Physiography: Streamward edge of the 12-meter Salt Croton Creek strath terrace.

Lithology: Shallow mantle of fine sandy alluvium and alluvial gravels, possibly of late Pleistocene origin, overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margin of the site.

Vegetation: Juniper, mesquite, beargrass, thistle and cactus.

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Condition: Slightly to moderately disturbed by sheet and gully erosion.

Assessment: On the basis of the documentation provided by SMU, it would appear that multiple aboriginal rock-lined hearths have been exposed by sheet erosion, but have suffered little lateral displacement. The site is relatively large, and the concentration of cultural material is dense. Further investigations could document the distribution, dimensions and contents of the features and assess the possibility that additional, shallowly buried cultural remains are present at the site. The information yield potential of 41SN15 seems high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: The site should be revisited during the course of the full inventory survey. All exposed features should be mapped, individually documented, and their contents separately collected. The site should be reassessed on the basis of the surface indications visible at that time. If the patterning and density of artifact distribution at the surface appear to warrant it, a controlled surface collection should be performed. If it appears likely that additional cultural remains lie buried immediately adjacent to the visible site area, excavations of a limited and exploratory nature should be conducted. Again, most of these decisions must remain tentative, awaiting a reassessment of the site in the field.

### 41SN16 (x41SN14; Dam Site 14, Survey Unit A-78)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1700 feet/518 meters

Dimensions: 20 meters N-S by 120 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 2.15 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek and 0.65 kilometers northwest of the confluence of Southerland and Salt Croton creeks.

Description: Dense scatter of chipped stone tools, cores, flakes, ground stone tool fragments and heat-fractured rock. Debitage is of quartzite and chert. Three concentrations of these materials were observed by the SMU survey crew in 1973 and were presumed to be hearths. Two retouched flakes, three unifaces, one abraded cobble and two arrow points (Harrell and Scallorn) were observed. Site area is relatively large. The site was not revisited by the present survey.

Physiography: Streamward edge of the 12-meter Salt Croton Creek strath terrace.

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Lithology: Shallow mantle of fine sandy alluvium and alluvial gravels, possibly of late Pleistocene origin, overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margin of the site.

Vegetation: Junipers, grasses and forbs.

Condition: Slightly to moderately disturbed by sheet erosion.

Assessment: The arrow points observed by the SMU survey crew indicate the presence of at least one Late Prehistoric component at 41SN16. The documentation provided by SMU suggests that the site is relatively large, exhibiting a high density of cultural material and at least three deflated but otherwise intact cultural features. The information yield potential of 41SN16 seems moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: Site 41SN16 should be revisited and reassessed during the course of the full inventory survey. The exposed cultural features should be mapped, individually documented, and their contents separately collected. The potential productivity of both controlled surface collection and/or test excavations should be addressed in a reassessment of the site at that time.

41SN17 (Dam Site 19, Survey Unit A-167)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1545 feet/471 meters

Dimensions: 200 meters N-S by 50 meters E-W

Location: At the eastern end of the Dam Site 19 basin, along the middle reaches of an unnamed left-bank tributary of North Croton Creek. The site is 1.7 kilometers northwest of the confluence of Smelter and North Croton creeks and 6.8 kilometers west of the confluence of North Croton Creek and the Brazos River.

Description: Extensive but diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. Debitage is predominantly quartzite with some chert. Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a small left-bank tributary of North Croton Creek, 10 meters above the former stream.



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**Lithology:** Shallow mantle of weathered sandstone overlying conglomerate of the San Angelo Formation. Gravels within conglomerate are primarily dolomite and limestone, with quartzite occurring rarely.

**Soil:** Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Lithic Torriorthent. Conglomerate bedrock is exposed over much of the site area.

**Vegetation:** Junipers, thistles, gramagrass, threeawn and prickly pear.

**Condition:** Severely disturbed by sheet and gully erosion and by machine brush clearing.

**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement both from sheet erosion and from machine brush clearing. Although the site is relatively large, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN17 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41SN18 (Dam Site 19, Survey Unit A-160)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1530 feet/466 meters

**Dimensions:** 53 meters N-S by 29 meters E-W

**Location:** At the eastern end of the Dam Site 19 basin, along the middle reaches of an unnamed left-bank tributary to North Croton Creek. The site is 1.75 kilometers northwest of the confluence of Smelter and North Croton creeks and 1.55 kilometers north of the gaging station on North Croton Creek.

**Description:** Diffuse scatter of chipped stone cores, flakes, ground stone tools, heat-fractured quartzite, and mussel shell. Debitage is of quartzite, chert and silicified wood. The remains of one severely disturbed hearth were observed to be distributed over an area roughly 7 meters in diameter. No other discernible features or artifact concentrations were noted. Site is of moderate size.

**Physiography:** Severely eroded remnant of the 12-to-15-meter North Croton Creek strath terrace.

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**Lithology:** Quaternary strath terrace deposit of sandy alluvium containing a moderate density of stream-rolled gravels. The terrace deposit was recorded as locality L41SN31.

**Soil:** Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly loamy sand, classifiable as an Ustic Torripsamment.

**Vegetation:** Juniper, yucca, prickly pear, thistles, gramagrass and threeawn grass.

**Condition:** Severely disturbed by sheet erosion.

**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The single observed cultural feature was severely disturbed, and it is highly unlikely that any additional features lie buried within the site. Although the site is of moderate size, the density of cultural material is fairly low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN18 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41SN19 (Dam Site 19, Survey Unit A-202)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1510 feet/460 meters

**Dimensions:** 20 meters N-S by 20 meters E-W

**Location:** At the eastern extremity of the Dam Site 19 basin, at the lower end of Bradley Creek. The site is 2.25 kilometers northeast of the gaging station on North Croton Creek and 1.65 kilometers northeast of the confluence of Smelter and North Croton creeks.

**Description:** Diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. Debitage is primarily chert with one quartzite flake. Site area is relatively small and may represent the severely disturbed remains of a single hearth.

**Physiography:** Canyon rim overlooking Bradley Creek, 12 meters above the stream.

**Lithology:** Shallow mantle of weathered sandstone overlying conglomerate of the San Angelo Formation. Gravels within conglomerate are primarily dolomite and limestone, with quartzite occurring rarely.

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Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Lithic Torriorthent. Conglomerate bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, tasajillo, gramagrass and prickly pear.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN19 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN20 (Dam Site 19, Survey Unit A-201)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1510 feet/460 meters

Dimensions: 100 meters N-S by 80 meters E-W

Location: At the eastern end of the Dam Site 19 basin, at the lower end of Bradley Creek. The site is 2.25 kilometers northeast of the gaging station on North Croton Creek and 1.65 kilometers northeast of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite, associated with the severely disturbed remains of nine presumed hearths. One biface manufacturing failure was collected (Appendix III). Debitage is primarily chert, with some quartzite. Site area is of moderate size.

Physiography: Canyon rim overlooking Bradley Creek, 12 meters above the stream.

Lithology: Thinly interbedded shale and poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Typic Ustorthent.

Vegetation: Juniper, mesquite, grasses and prickly pear.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The nine observed cultural features were quite severely disturbed and their contents were scattered over an area 3 to 5 meters in diameter in most cases. It is highly unlikely that any additional buried cultural features are present. Although the site is relatively large, the overall density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN20 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN21 (Dam Site 19, Survey Unit A-192)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1505 feet/459 meters

Dimensions: 20 meters N-S by 40 meters E-W

Location: At the eastern end of the Dam Site 19 basin, at the lower end of Bradley Creek. The site is 2.25 kilometers northeast of the gaging station on North Croton Creek and 1.7 kilometers northwest of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. One concentration of heat-fractured rock in the center of the site may represent the remains of a severely disturbed hearth. Debitage is of quartzite. Site area is of moderate size.

Physiography: Canyon rim overlooking Bradley Creek, 12 meters above the stream.

Lithology: Thinly interbedded shale and poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Lithic Ustorthent.

Vegetation: Juniper and sparse cover of threeawn and gramagrass.

Condition: Severely disturbed by gully and sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The single observed cultural feature was severely disturbed, with its contents scattered over an area 2 meters in diameter, and it is highly

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unlikely that any additional buried cultural features are present. The site is relatively small, the density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN21 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN22 (Dam Site 19, Survey Unit A-192)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1520 feet/463 meters

Dimensions: 2 meters N-S by 2 meters E-W

Location: At the eastern end of the Dam Site 19 basin, at the lower end of Bradley Creek. The site is 2.3 kilometers northeast of the gaging station on North Croton Creek and 1.75 kilometers northeast of the confluence of Smelter and North Croton creeks.

Description: Discrete concentration of heat-fractured dolomite and quartzite, presumably the remains of a single severely disturbed hearth. No other cultural materials were noted in the vicinity.

Physiography: Canyon rim overlooking Bradley Creek, 12 meters above the stream.

Lithology: Thinly interbedded shale and poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Lithic Ustorthent.

Vegetation: Sparse cover of juniper, gramagrass and threeawn.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site apparently consists of a single, highly disturbed cultural feature, and it is very unlikely that any additional buried cultural remains are present. Further investigations are not likely to produce additional significant data. The information yield potential of 41SN22 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN23 (Dam Site 19, Survey Unit A-192)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1525 feet/465 meters

Dimensions: 50 meters N-S by 50 meters E-W

Location: At the eastern end of the Dam Site 19 basin, at the lower end of Bradley Creek. The site is 1.75 kilometers northeast of the confluence of Smelter and North Croton creeks and 2.25 kilometers northeast of the gaging station on North Croton Creek.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. One concentration of these materials, 50 centimeters in diameter, may represent a disturbed hearth. Debitage is primarily of quartzite with some chert. One biface manufacturing failure was collected (Appendix III). Site area is of moderate size.

Physiography: Canyon rim overlooking Bradley Creek, 12 meters above the stream.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock is exposed over much of the site area.

Vegetation: Juniper, small acacias, yucca, prickly pear and short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The single observed cultural feature is moderately disturbed, and it is highly unlikely that any additional buried cultural features are present. Although the site is of moderate size, its density of cultural material is quite low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN23 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN24 (Dam Site 19, Survey Unit A-192)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1495 feet/456 meters

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Dimensions: 5 meters N-S by 5 meters E-W

Location: At the eastern end of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 2.25 kilometers northwest of the gaging station on North Croton Creek and 1.75 kilometers northeast of the confluence of Smelter and North Croton creeks.

Description: Discrete concentration of heat-fractured quartzite and dolomite cobbles, approximately 5 meters in diameter, presumably the remains of a single, severely disturbed hearth. No other cultural materials were noted in the vicinity.

Physiography: Bedrock bench overlooking Bradley Creek, 6 meters above the stream.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Juniper, tasajillo and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site apparently consists of a single, highly disturbed cultural feature. It is very unlikely that any additional buried cultural remains are present, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN24 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN25 (Dam Site 19, Survey Unit A-191)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1565 feet/477 meters

Dimensions: 80 meters N-S by 40 meters E-W

Location: At the eastern end of the Dam Site 19 basin, along the middle reaches of Bradley Creek. The site is 2.45 kilometers northeast of the gaging station on North Croton Creek and 1.95 kilometers northeast of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. One concentration of 16 heat-fractured quartzite

fragments, 50 centimeters in diameter, appears to be the remains of a disturbed hearth. Debitage is primarily quartzite with little chert. Site area is of moderate size.

Physiography: Bedrock bench overlooking Bradley Creek, 9 meters above the stream.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, tasajillo, prickly pear, crotongrass and threeawn grass.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The single observed cultural feature is disturbed, and it is highly unlikely that any additional buried cultural features are present. Although the site is fairly large in area, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN25 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN27 (Dam Site 19, Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1515 feet/462 meters

Dimensions: 100 meters N-S by 65 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, along the lower reaches of Wedington Creek. The site is 0.8 kilometer southwest of the gaging station on North Croton Creek and 1.35 kilometers southwest of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone cores, flakes, ground stone tools, heat-fractured quartzite and sandstone, bones and mussel shells. Five discrete concentrations of these materials were observed; they apparently represent the remains of deflated but otherwise undisturbed hearths (Table 25). The observed features are evenly spaced across the site, 25 to 35 meters apart. Site is moderately large in area.



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TABLE 25  
FEATURE DESCRIPTIONS, 41SN27

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- F-1: Dimensions: 10 centimeters in diameter  
Contents: 5 heat-fractured gray, fine-grained quartzite cobble fragments; 1 Ogallala quartzite flake (unburned); 1 chert flake (unburned).
- F-2: Dimensions: 20 centimeters in diameter  
Contents: 13 heat-fractured gray, light red and purple, fine-grained quartzite cobble fragments; 3 Ogallala quartzite flakes (unburned); 2 chert flakes (unburned); 2 abraded sandstone cobble fragments (unburned).
- F-3: Dimensions: 50 centimeters in diameter  
Contents: 15 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 2 Ogallala quartzite flakes (unburned); 3 chert flakes (unburned); 1 battered gray, coarse-grained quartzite cobble (unburned); 1 copper sulphate fragment (unburned).
- F-4: Dimensions: 90 centimeters in diameter  
Contents: 10 heat-fractured gray, fine-grained quartzite and red sandstone cobble fragments; 3 chert flakes (unburned); 1 abraded gray, medium-grained quartzite cobble (unburned).
- F-5: Dimensions: 90 centimeters in diameter  
Contents: 25 heat-fractured gray and purple, fine-grained quartzite and red sandstone cobble fragments; 20 miscellaneous quartzite flakes (unburned); 12 chert flakes (unburned); 2 abraded gray, medium-grained quartzite cobbles (unburned); 2 copper sulphate fragments (unburned); 2 unidentifiable freshwater mussel shell fragments (unburned).

NOTE: The present dimensions of F-3 and F-4 are largely attributable to post-occupational disturbance. The features were probably originally 30 to 40 centimeters in diameter.

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Physiography: Canyon rim overlooking Wedington Creek, 12 meters above the stream.

Lithology: Poorly consolidated sandstone, San Angelo Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock is exposed along the streamward edge of the site area.

Vegetation: Juniper, tasajillo, agarita, catclaw, sumac, prickly pear, various grasses and forbs.

Condition: Moderately disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits within the observed site area are largely or entirely deflated but have suffered only slight to moderate lateral displacement. The soil to the immediate south of the known site area is intact, and it is quite possible that additional undisturbed cultural features are contained in that area and are buried no more than 20 centimeters below the surface. Further investigations could fruitfully supply more detailed documentation of the exposed features and explore the potential presence of buried cultural remains. The information yield potential of 41SN27 seems moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: The exposed cultural features should be carefully mapped (only a compass and pace map was prepared by the present survey), individually documented, and their contents separately collected. Excavations of a limited and exploratory nature should be conducted to the immediate south of the known site area to investigate the potential presence of intact, shallowly buried cultural remains.

41SN28 (Dam Site 19, Survey Unit B-195)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1570 feet/479 meters

Dimensions: Less than 1 meter in diameter

Location: At the southeastern end of the short tributary of Smelter Creek. The site is 7 kilometers northwest of the confluence of Panther Creek and the Brazos River and 1.8 kilometers northwest of Kiowa Peak.

Description: One retouched chert flake and one unmodified chert flake were found roughly 1 meter apart. The retouched flake was collected (Appendix III). No other cultural material was observed in the vicinity.

Physiography: Valley margin slope, 6 meters above the stream.

Lithology: Sandy shale, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Lithic Ustorthent. Bedrock is exposed over much of the site area.

Vegetation: Moderately dense cover of mesquite, juniper, yucca, lechugilla, prickly pear, grasses and forbs.

Condition: Severely disturbed by sheet and gully erosion.

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**Assessment:** Surface indications suggest that the cultural deposits are completely deflated. Only two artifacts were observed, and it is highly unlikely that any additional buried cultural remains are present. Further investigations are not likely to produce additional significant data. The information yield potential of 41SN28 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** No further work is warranted.

### 41SN29 (Dam Site 19, Survey Unit B-193)

**USGS Quadrangle:** 7.5' Kiowa Peak 1962

**Elevation:** 1590 feet/485 meters

**Dimensions:** Isolated find

**Location:** At the southeastern end of the Dam Site 19 basin, at the head of a short tributary of Smelter Creek. The site is 3.45 kilometers northwest of Kiowa Peak and 7.5 kilometers northwest of the confluence of Panther Creek and the Brazos River.

**Description:** Isolated find of a chert dart point. The projectile point, which was collected, is not typologically classifiable (Appendix III).

**Physiography:** Bedrock bench overlooking a short tributary of Smelter Creek, 10 meters above the former stream.

**Lithology:** Shallow mantle of weathered sandstone underlain by gypsum of the Blaine Formation.

**Soil:** Owens-Badland Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

**Vegetation:** Sparse cover of juniper, featherplume and low grasses.

**Condition:** Severely disturbed by sheet and gully erosion.

**Assessment:** The entire area surrounding the site has been severely deflated, yet no cultural remains other than the dart point were observed. It is highly unlikely that any additional buried cultural remains are present. The information yield potential of 41SN29 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** No further work is warranted.

41SN30 (Dam Site 19, Survey Unit A-157)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1555 feet/474 meters

Dimensions: 50 meters N-S by 25 meters E-W

Location: In the east-central portion of the Dam Site 19 basin, at the head of an intermittent tributary of lower Wedington Creek. The site is 0.95 kilometer west of the gaging station on North Croton Creek and 1.65 kilometers west of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. Two discrete concentrations of such materials, presumably the remains of hearths, were noted at the streamward end of the site; they are roughly 10 meters apart. These features are individually described in Table 26. The site is of moderate size, but no other features or artifact concentrations were noted.

TABLE 26

FEATURE DESCRIPTIONS, 41SN30

F-1: Dimensions: 50 centimeters in diameter

Contents: 10 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 2 Ogallala quartzite cores (unburned); 5 Ogallala quartzite flakes (unburned); 1 battered gray, medium-grained quartzite cobble (unburned).

F-2: Dimensions: 100 centimeters in diameter

Contents: 14 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 1 red, fine-grained quartzite core (unburned); 3 Ogallala quartzite flakes (unburned); 2 chert cores (unburned); 1 chert flake (unburned); 1 silicified wood core (unburned).

NOTE: The apparent greater size of F-2 is probably attributable to post-occupational disturbance. The material was much more diffusely distributed than that comprising F-1.

Physiography: Bedrock bench overlooking a small, left-bank tributary of Wedington Creek, 12 meters above the former stream.

Lithology: Shallow mantle of shaly clay overlying dolomite, Blaine Formation.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a clay loam, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: A sparse cover of juniper, prickly pear, acacia and grasses.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe erosion. It is highly unlikely that any cultural features other than the two observed by the survey are present. Although the site is of moderate size, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN30 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN31 (Dam Site 19, Survey Unit A-204)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1535 feet/468 meters

Dimensions: 5 meters N-S by 8 meters E-W

Location: At the eastern extremity of the Dam Site 19 basin, at the lower end of an unnamed right-bank tributary of North Croton Creek. The site is 2.6 kilometers southeast of the gaging station on North Croton Creek and 1.85 kilometers southeast of the confluence of Smelter and North Croton creeks.

Description: Discrete concentration of chipped stone cores and flakes. All debitage is quartzite. Site area is very small; no discernible features or artifact concentrations were noted.

Physiography: Valley margin slope overlooking a small, right-bank tributary of North Croton Creek, 21 meters above the former stream.

Lithology: Poorly consolidated sandstone, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock is exposed over most of the site surface.

Vegetation: Sparse cover of juniper.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. Although the density of cultural material is fairly high, the site is extremely small, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN31 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN32 (Dam Site 19, Survey Unit A-212)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1545 feet/471 meters

Dimensions: 8 meters N-S by 20 meters E-W

Location: At the eastern extremity of the Dam Site 19 basin, at the lower end of an unnamed right-bank tributary of North Croton Creek. The site is 2.7 kilometers southeast of the gaging station on North Croton Creek and 2 kilometers southeast of the confluence of Smelter and North Croton creeks.

Description: Discrete concentration of chipped stone tools and flakes. A planoconvex uniface, one retouched flake, and one edge-damaged flake were collected (Appendix III). Lithics are composed of chert and quartzite. Site area is relatively small; no discernible features or concentrations were noted.

Physiography: Bedrock bench overlooking a small right-bank tributary of North Croton Creek, 21 meters above the former stream.

Lithology: Sandy shale, Choza Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a sandy clay loam, classifiable as a Lithic Ustorthent. Shale bedrock is exposed over much of the site area.

Vegetation: Mesquite, juniper, catclaw, mormon tea, prickly pear, various grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. Although the density of cultural material is fairly high, the site is very small, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN32 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN33 (Dam Site 19, Survey Unit B-177)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1505 feet/459 meters

Dimensions: 90 meters N-S by 90 meters E-W

Location: In the southern area of the Dam Site 19 basin, at the lower end of Wedington Creek. The site is 1.6 kilometers southwest of the gaging station on North Croton Creek and 2.3 kilometers west of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone cores, flakes, ground stone tools and heat-fractured quartzite. Within the southern (streamward) half of the site, six discrete concentrations of these materials were observed; presumably they are the remains of deflated hearths (Table 27). The features are fairly evenly spaced across the site, averaging 20 to 25 meters from one another. The lithic material surrounding the features is dominated by various quartzites, with some chert and silicified wood also occurring. Site area is relatively large.

Physiography: Bedrock bench overlooking Wedington Creek, 6 meters above the present stream.

Lithology: Shallow mantle of shaly clay overlying dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a clay loam, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out along the streamward margin of the site.

Vegetation: Sparse cover of juniper, mesquite, prickly pear, yucca, featherplume and grasses.

Condition: The southern half of the site has been moderately to severely disturbed by sheet erosion, but the northern half has suffered only moderately from this disturbance.

Assessment: Surface indications suggest that the cultural deposits within the southern half of the site, where the six exposed cultural features occur, have been largely or entirely deflated and have suffered some slight lateral displacement. However, the soil of the northern half of the site is largely intact, and it is very likely that intact cultural features will be found shallowly buried in that area, 15 to 20 centimeters below the surface. The information yield potential of 41SN33 is moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

TABLE 27  
FEATURE DESCRIPTIONS, 41SN33

- F-1: Dimensions: 50 centimeters N-S by 25 centimeters E-W  
Contents: 7 heat-fractured gray, red and purple, fine- and medium-grained quartzite cobble fragments; 1 light brown, fine-grained quartzite core (unburned); 2 Ogallala quartzite flakes (unburned).
- F-2: Dimensions: 25 centimeters N-S by 50 centimeters E-W  
Contents: 11 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 3 purple and red, fine-grained quartzite flakes (unburned); 1 silicified wood core (unburned).
- F-3: Dimensions: 10 centimeters in diameter  
Contents: 4 heat-fractured gray, fine-grained quartzite cobble fragments; 2 black, fine-grained quartzite flakes (unburned).
- F-4: Dimensions: 10 centimeters N-S by 15 centimeters E-W  
Contents: 6 heat-fractured gray and black, fine-grained quartzite cobble fragments; 1 white, fine-grained quartzite flake (unburned).
- F-5: Dimensions: 50 centimeters in diameter  
Contents: 13 heat-fractured gray and purple, fine-grained quartzite cobble fragments, 1 Ogallala quartzite core (unburned); 6 Ogallala quartzite flakes (unburned); 2 purple, fine-grained quartzite flakes (unburned); 3 chert flakes (unburned).
- F-6: Dimensions: 10 centimeters in diameter  
Contents: 7 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 2 Ogallala quartzite flakes (unburned); 1 light red, fine-grained quartzite flake (unburned); 1 abraded light red, fine-grained quartzite cobble fragment (unburned).

Recommendations: The exposed cultural features in the southern half of the site should be carefully mapped (only a compass and pace map was prepared by the present survey), individually documented, and their contents separately collected. Excavations of a limited and exploratory nature should be conducted in the northern half of the site to investigate the possible presence of intact, shallowly buried cultural remains.

41SN34 (Dam Site 19, South of Survey Unit A-138)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1620 feet/494 meters



## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Dimensions: 45 meters N-S by 125 meters E-W

Location: In the southern area of the Dam Site 19 basin, at the head of a short right-bank tributary of North Croton Creek. The site is 2.5 kilometers northwest of the gaging station on North Croton Creek and 3.2 kilometers northwest of the confluence of Smelter and North Croton creeks.

Description: Diffuse scatter of chipped stone tools, cores, flakes, ground stone tool fragments and heat-fractured quartzite. Twenty-four discrete concentrations of such materials were observed within the northeastern (streamward) half of the site and are presumed to be the remains of hearths (Table 28). The features occur in two clusters, about 35 meters apart. Within each cluster, the features are quite evenly spaced relative to one another, at a spacing of 3 to 5 meters. Chipped stone materials are primarily Ogallala quartzite and chert. Site area is quite large.

Physiography: Canyon rim overlooking North Croton Creek, 45 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock is exposed at the surface in places.

Vegetation: Sparse cover of juniper, skunkbush, mesquite, prickly pear, sideoats grama and verbena.

Condition: The northeastern (streamward) half of the site has been moderately disturbed by sheet erosion, but the southwestern half has suffered little from erosion.

Assessment: Surface indications suggest that the cultural deposits within the northeastern (streamward) half of the site, where the 24 exposed cultural features occur, have been largely or entirely deflated and have suffered some slight lateral displacement. However, the soil of the southwestern half of the site is largely intact, and it is very likely that intact cultural features will be found shallowly buried in that area, 15 to 20 centimeters below the surface. The information yield potential of 41SN34 is moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

Recommendations: The exposed cultural features in the northeastern half of the site should be carefully mapped (only a compass and pace map was prepared by the present survey), individually documented, and their contents separately collected. Excavations of a limited and exploratory nature should be conducted in the southwestern half of the site to investigate the possible presence of intact, shallowly buried cultural remains.

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TABLE 28  
FEATURE DESCRIPTIONS, 41SN34

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- F-1: Dimensions: 60 centimeters N-S by 44 centimeters E-W  
Contents: 19 heat-fractured gray, fine- and coarse-grained quartzite cobble fragments; 8 heat-fractured dolomite fragments; 1 heat-fractured shale fragment; 1 chert flake (unburned).
- F-2: Dimensions: 90 centimeters N-S by 95 centimeters E-W  
Contents: 11 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 17 heat-fractured dolomite fragments.
- F-3: Dimensions: 42 centimeters N-S by 35 centimeters E-W  
Contents: 9 heat-fractured gray, red and purple, fine-grained quartzite cobble fragments; 5 heat-fractured dolomite fragments; 1 Ogallala quartzite flake (unburned); 2 chert flakes (unburned); 2 unmodified chert pebbles (unburned).
- F-4: Dimensions: 105 centimeters N-S by 70 centimeters E-W  
Contents: 5 heat-fractured brown, coarse-grained quartzite cobble fragments; 1 chert flake (unburned).
- F-5: Dimensions: 35 centimeters N-S by 40 centimeters E-W  
Contents: 8 heat-fractured gray and brown, fine-grained quartzite cobble fragments; 2 heat-fractured Ogallala quartzite cobble fragments.
- F-6: Dimensions: 35 centimeters N-S by 40 centimeters E-W  
Contents: 11 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 4 heat-fractured dolomite fragments; 5 Ogallala quartzite flakes (unburned); 1 abraded red, fine-grained quartzite cobble (unburned); 1 siliceous conglomerate fragment (unburned).
- F-7: Dimensions: 21 centimeters N-S by 35 centimeters E-W  
Contents: 16 heat-fractured gray, red and purple, fine-grained quartzite cobble fragments; 4 heat-fractured dolomite fragments; 1 Ogallala quartzite flake (unburned); 1 unmodified chert pebble (unburned).
- F-8: Dimensions: 54 centimeters N-S by 75 centimeters E-W  
Contents: 17 heat-fractured gray, black and purple, fine-grained quartzite cobble fragments; 6 heat-fractured dolomite fragments; 4 Ogallala quartzite flakes (unburned); 1 abraded Ogallala quartzite cobble (unburned); 1 unmodified silicified wood fragment (unburned).

Table 28, continued

- F-9: Dimensions: 30 centimeters N-S by 60 centimeters E-W  
Contents: 7 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 5 heat-fractured dolomite fragments; 1 heat-fractured silicified wood fragment.
- F-10: Dimensions: 48 centimeters N-S by 40 centimeters E-W  
Contents: 14 heat-fractured gray, brown and black, fine-grained quartzite cobble fragments; 12 heat-fractured dolomite fragments; 1 chert flake (unburned).
- F-11: Dimensions: 50 centimeters N-S by 30 centimeters E-W  
Contents: 25 heat-fractured gray, black and purple, fine-grained quartzite cobble fragments; 7 heat-fractured dolomite fragments; 2 Ogallala quartzite core fragments (unburned); 1 chert flake (unburned); 1 abraded pale red, medium-grained quartzite cobble (unburned); 2 unmodified chert pebbles (unburned).
- F-12: Dimensions: 75 centimeters N-S by 65 centimeters E-W  
Contents: 5 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 9 heat-fractured Ogallala quartzite cobble fragments; 7 heat-fractured dolomite fragments; 2 chert flakes (unburned); 1 battered and abraded red, fine-grained quartzite cobble (unburned).
- F-13: Dimensions: 35 centimeters N-S by 30 centimeters E-W  
Contents: 10 heat-fractured Ogallala quartzite cobble fragments; 4 heat-fractured dolomite fragments; 1 Ogallala quartzite core fragment (unburned); 1 retouched chert flake (unburned; not collected); 1 unmodified chert pebble (unburned).
- F-14: Dimensions: 40 centimeters N-S by 25 centimeters E-W  
Contents: 13 heat-fractured gray and red, fine-grained quartzite cobble fragments; 2 Ogallala quartzite flakes (unburned).
- F-15: Dimensions: 30 centimeters N-S by 35 centimeters E-W  
Contents: 12 heat-fractured gray, brown and red, fine-grained quartzite cobble fragments; 2 heat-fractured selenite fragments; 1 light red, fine-grained quartzite flake (unburned); 1 unmodified white quartz cobble (unburned).
- F-16: Dimensions: 20 centimeters N-S by 25 centimeters E-W  
Contents: 10 heat-fractured gray, red and purple, fine-grained quartzite cobble fragments; 1 heat-fractured shale fragment; 2 Ogallala quartzite flakes (unburned).
- F-17: Dimensions: 20 centimeters in diameter  
Contents: 3 heat-fractured gray and white, fine-grained quartzite cobble fragments; 1 chert core fragment (unburned); 1 abraded white, fine-grained quartzite cobble (unburned).

Table 28, continued

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- F-18: Dimensions: 35 centimeters N-S by 30 centimeters E-W  
Contents: 4 heat-fractured gray, brown and purple, fine-grained quartzite cobble fragments; 1 heat-fractured shale fragment; 2 chert flakes (unburned); 1 abraded and battered red, fine-grained quartzite cobble (unburned).
- F-19: Dimensions: 160 centimeters N-S by 120 centimeters E-W  
Contents: 247 heat-fractured gray, brown, red, white and purple, fine-grained quartzite cobble fragments; 35 heat-fractured dolomite fragments; 12 heat-fractured shale fragments; 6 heat-fractured silicified wood cobble fragments; 1 heat-fractured chert cobble fragment; 4 Ogallala quartzite flakes (unburned); 1 Tecovas jasper core (unburned); 2 chert flakes (unburned); 1 silicified wood flake (unburned); 2 abraded brown, medium-grained quartzite cobbles (unburned).
- F-20: Dimensions: 35 centimeters N-S by 50 centimeters E-W  
Contents: 8 heat-fractured gray, red and white, fine-grained quartzite cobble fragments; 5 chert flakes (unburned); 1 white fine-grained quartzite flake (unburned); 1 abraded gray, fine-grained quartzite cobble (fire-reddened).
- F-21: Dimensions: 30 centimeters N-S by 45 centimeters E-W  
Contents: 9 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 1 chert arrow point fragment, classifiable as type Huffaker (Appendix III); 8 chert flakes (unburned).
- F-22: Dimensions: 40 centimeters N-S by 60 centimeters E-W  
Contents: 11 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 4 chert flakes (unburned).
- F-23: Dimensions: 20 centimeters N-S by 15 centimeters E-W  
Contents: 13 heat-fractured brown, red and purple, fine-grained quartzite cobble fragments; 1 abraded gray, fine-grained quartzite cobble fragment.
- F-24: Dimensions: 25 centimeters N-S by 20 centimeters E-W  
Contents: 8 heat-fractured gray and white, fine-grained cobble fragments; 1 chert flake (unburned).
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41SN35 (Dam Site 19, Survey Unit B-165)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1560 feet/475 meters

Dimensions: 600 meters N-S by 200 meters E-W

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

**Location:** In the southern portion of the Dam Site 19 basin, along the lower reaches of Wedington Creek. The site is 5.7 kilometers west-northwest of Kiowa Peak and 9.8 kilometers northwest of the confluence of Panther Creek and the Brazos River.

**Description:** Extensive, diffuse to moderately dense scatter of chipped stone tools, cores and flakes, ground stone tools, heat-fractured rocks and mussel shell fragments. Six concentrations of these materials were observed, designated F-1 through F-6 (Table 29). F-1 through F-5 are clustered in the southeastern quarter of the site, a relatively eroded area, and F-6 was found at its northwestern extremity. One dart point fragment was collected from the surface of the site (Appendix III). The chipped stone materials are primarily Ogallala quartzite and local cherts, and the burned rock is dominated by gray and purple, fine-grained quartzite and dolomite.

**Physiography:** Canyon rim overlooking Wedington Creek, 18 to 20 meters above the stream.

**Lithology:** Weathered silt loam overlying gypsum of the Blaine Formation.

**Soil:** Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a silt loam, classifiable as a Typic Ustochrept.

**Vegetation:** Moderate to sparse cover of juniper, mesquite, prickly pear, featherplume, tasajillo, sumac, yucca and varicus short grasses.

**Condition:** The southeastern quarter of the site has been moderately disturbed by sheet and rill erosion, but the remainder seems largely undisturbed.

**Assessment:** Surface indications suggest that the cultural deposits within the southeastern quarter of the site are at least partially deflated, and have suffered moderate lateral displacement. However, the soil over most of the site remainder is largely intact, and it is very likely that additional, shallowly buried cultural remains are present, probably within 25 centimeters of the surface. The information yield potential of 41SN35 is moderate to high, and the site may be eligible for nomination to the National Register of Historic Places.

**Recommendations:** The exposed cultural features in the southeastern quarter of the site should be carefully mapped (only a compass and pace map was prepared by the present survey), individually documented, and their contents separately collected. Excavations of a limited and exploratory nature should be conducted within the remainder of the site to investigate the potential presence of intact, shallowly buried cultural remains.

TABLE 29

FEATURE DESCRIPTIONS, 41SN35

- F-1: Dimensions: 20 centimeters in diameter  
Contents: 1 dark gray quartzite flake (unburned); 2 light brown chert cores (unburned); 10 brown, reddish-brown and red chert flakes.
- F-2: Dimensions: 10 meters N-S by 20 meters E-W  
Contents: Diffuse scatter of heat-fractured quartz, quartzite and dolomite; quartzite flakes (unburned); 1 Ogallala quartzite core (unburned); 1 battered and abraded quartzite cobble (unburned); 1 abraded quartzite cobble (unburned).
- F-3: Dimensions: 50 centimeters N-S by 100 centimeters E-W  
Contents: 1 Ogallala quartzite core (unburned); 2 Ogallala quartzite flakes (unburned); 3 gray and white chert flakes (unburned); 1 battered quartzite cobble (unburned).
- F-4: Dimensions: 2 meters N-S by 3 meters E-W  
Contents: 10 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 1 Ogallala quartzite core (unburned); 7 Ogallala quartzite flakes (unburned); 1 abraded sandstone cobble (unburned).
- F-5: Dimensions: 200 centimeters N-S by 50 centimeters E-W  
Contents: 1 heat-fractured gray, fine-grained quartzite cobble fragment; 1 Ogallala quartzite core (unburned); 2 light red quartzite flakes (unburned); 2 brown chert flakes (unburned).
- F-6: Dimensions: 5 meters N-S by 6 meters E-W  
Contents: Moderately dense scatter of heat-fractured dolomite associated with a small amount of Ogallala quartzite and chert debitage.

41SN36 (Dam Site 14, Survey Unit A-77)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1700 feet/518 meters

Dimensions: 8 meters N-S by 6 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 0.65 kilometer west of the confluence of Southerland and Salt Croton creeks and 2 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

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A PRELIMINARY ASSESSMENT OF THE CULTURAL RESOURCES IN THE BRAZO--ETC(U)  
NOV 81 J P THURNOND, M D FREEMAN, S L ANDREWS DACW63-81-C-0095

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## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. One edge-damaged flake was collected (Appendix III). Debitage is of chert. Site area is very small. No discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking Salt Croton Creek, 12 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, mesquite and grasses.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is quite small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN36 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN37 (Dam Site 14, Survey Unit A-77)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1705 feet/520 meters

Dimensions: Isolated find

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 2.2 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek and 0.95 kilometer west of the confluence of Southerland and Salt Croton creeks.

Description: Isolated find of a large quartzite flake. The specimen was believed to be modified at the time of its collection, but laboratory analysis detected no edge modification or use wear. No other artifactual materials were observed; no discernible features were noted.

Physicgraphy: Bedrock bench overlooking Salt Croton Creek, 12 meters above the stream.



Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

Vegetation: Sparse cover of mesquite, prickly pear and various short grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: The entire area surrounding the site has been severely deflated, yet no cultural material other than the quartzite flake was observed. It is highly unlikely that any additional buried cultural remains are present. The information yield potential of 41SN37 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

41SN38 (Dam Site 14, Survey Unit A-85)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1685 feet/514 meters

Dimensions: 1 meter N-S by 1.3 meters E-W

Location: At the eastern extremity of the Dam Site 14 basin, at the lower end of Bitter Gulch. The site is 1.15 kilometers southeast of the confluence of Southerland and Salt Croton creeks and 3 kilometers southeast of the gaging station on Salt Croton Creek.

Description: A discrete concentration of 80 to 100 heat-fractured gray, brown, red and purple, fine- to medium-grained quartzite cobble fragments, and a few heat-fractured dolomite fragments; presumably these are the remains of a hearth. No other cultural material was observed in the vicinity.

Physiography: Remnant of the 6-to-9-meter Salt Croton Creek fill terrace.

Lithology: Holocene alluvium of the second (6-to-9-meter) terrace above Salt Croton Creek; very fine sandy loam in texture.

Soil: Yomont very fine sandy loam mapping unit. The Yomont soils are Typic Ustifluvents. Soil of the terrace surface is indeed a very fine sandy loam but exhibits a structural B horizon and is perhaps more accurately classified as a Fluventic Ustochrept.

Vegetation: Yucca and low grasses.

## APPENDIX I: PREHISTORIC SITE DESCRIPTIONS

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Condition: Moderately to severely disturbed by sheet and rill erosion.

Assessment: The burned rock concentration is deflated but appears to have suffered little lateral displacement of its contents. Given the geomorphological interpretation of the associated terrace deposits as very late Holocene (Appendix V), it seems likely that the feature is of Late Prehistoric or Historic origin. Despite the severe deflation of the terrace surface, no other cultural material is visible in the vicinity, and no such material was observed in adjacent streamcut profiles. There is no indication of the presence of additional subsurface cultural remains, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN38 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN39 (Dam Site 14, Survey Unit A-76)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1690 feet/515 meters

Dimensions: 1 meter N-S by 4 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 0.65 kilometer northwest of the confluence of Southerland and Salt Croton creeks and 2.1 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

Description: Discrete concentration of approximately 125 heat-fractured dolomite fragments; presumably this represents the remains of a disturbed hearth. No other cultural material was observed in the vicinity.

Physiography: Remnant of the 6-to-9-meter Salt Croton Creek fill terrace.

Lithology: Holocene alluvium of the second (6-to-9-meter) terrace above Salt Croton Creek; very fine sandy loam in texture.

Soil: Yomont very fine sandy loam mapping unit. The Yomont soils are Typic Ustifluvents. Soil of the terrace surface is indeed a very fine sandy loam but exhibits a structural B horizon and is perhaps more appropriately classified as a Fluventic Ustochrept.

Vegetation: Sparse cover of juniper, thistles and mid grasses.

Condition: Severely disturbed by sheet and gully erosion.

**Assessment:** The burned rock concentration is deflated, and its contents appear to have suffered moderate east-west lateral displacement. Given the geomorphological interpretation of the associated terrace deposits as very late Holocene (Appendix V), it seems likely that the feature is of Late Prehistoric or Historic origin. Despite the severe deflation of the terrace surface, no other cultural material is visible in the vicinity, and no such material was observed in adjacent streamcut profiles. There is thus no indication of the presence of additional subsurface cultural remains, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN39 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

41SN40 (Dam Site 14, Survey Unit A-72)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1680 feet/512 meters

Dimensions: 700 meters NE-SW by 25 meters SE-NW

**Location:** In the southwestern portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 1.1 kilometers southwest of the gaging station on Salt Croton Creek and 1.3 kilometers west of the confluence of Southerland and Salt Croton creeks.

**Description:** Extensive, diffuse scatter of chipped stone cores and flakes and heat-fractured rock fragments in association with a dense lag concentration of stream-rolled gravels. No features or artifact concentrations were noted. The material appears to be in a secondary depositional context; see Assessment.

**Physiography:** Eroding from the base of a shallow, recent fill terrace, 1 to 3 meters above the present Salt Croton Creek channel.

**Lithology:** Recent alluvium of Salt Croton Creek, incorporating redeposited gravels of earlier, higher stream terraces. See discussion of Dam Site 14 basin terraces in Appendix V. Alluvium is a gravelly fine sandy loam in texture.

**Soil:** Yomont gravelly fine sandy loam, a Typic Ustifluvent.

**Vegetation:** Juniper, yucca, prickly pear, agarita, thistles, mesquite and grasses.

**Condition:** The terrace from which the cultural material derives is being eroded by the lateral migration of Salt Croton Creek. The visible cultural material forms a lag concentration immediately alongside the

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stream channel where the overlying terrace fill has been completely scoured away.

**Assessment:** As is discussed in greater detail in Appendix V, the terrace deposit from which the cultural materials exposed at 41SN40 are eroding is almost certainly of very recent origin, probably dating within the last century. The articulated skeleton of a modern domesticated cow was observed eroding from the base of an adjacent remnant of this terrace. It is virtually certain that the cultural material exposed at 41SN40 is in secondary context, and the deposit would perhaps have been more properly recorded as a locality. The information yield potential of 41SN40 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41SN41 (Dam Site 14, Survey Unit B-54)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1740 feet/530 meters

Dimensions: 15 meters N-S by 40 meters E-W

**Location:** At the southwestern extremity of the Dam Site 14 basin, on the southern margin of the large salt flat at the head of Salt Croton Creek. The site is 3.5 kilometers southwest of the gaging station on Salt Croton Creek and 4 kilometers west of the confluence of Southerland and Salt Croton creeks.

**Description:** Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite. One concentration of these materials, presumed to be the remains of a hearth, was observed at the northwestern extremity of the site. The feature is 2.5 meters in diameter and contains 80 to 100 heat-fractured quartzite cobble fragments and 12 unburned chert flakes. No other features or artifact concentrations were noted.

**Physiography:** Bedrock bench overlooking the salt flat, 12 meters above the floor.

**Lithology:** Shallow mantle of weathered sandstone overlying gypsum of the Whitehorse Group.

**Soil:** Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over much of the site area.

**Vegetation:** Juniper, mesquite, sumac, prickly pear, tasajillo, featherplume, catclaw and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. The single observed cultural feature is moderately disturbed, and it is highly unlikely that any additional features lie buried within the site. Although the site is of moderate size, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN41 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN42 (Dam Site 14, Survey Unit A-76)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1710 feet/521 meters

Dimensions: 50-100 meters N-S by 400 meters E-W

Location: In the central portion of the Dam Site 14 basin, along the middle reaches of Salt Croton Creek. The site is 1 kilometer northwest of the confluence of Southerland and Salt Croton creeks and 2.5 kilometers northwest of the confluence of Bitter Gulch and Salt Croton Creek.

Description: Moderately dense scatter of tested cobbles, cores and flakes associated with the upper segment of the lag gravel concentration recorded as locality L41SN26 (Appendix II). The tested cobbles and cores are quite numerous, and the flakes are relatively large and primarily corticate or partially decorticate. Chert and Ogallala quartzite dominate the debitage. No cultural features or artifact concentrations were noted.

Physiography: Streamward edge of the 12-meter Salt Croton Creek strath terrace (Appendix V).

Lithology: Pleistocene alluvium of the third (12-meter) terrace above Salt Croton Creek, very gravelly, very fine sandy loam in texture.

Soil: Owens-Badlands Association mapping unit. Soil of the terrace surface is a very gravelly, very fine sandy loam, classifiable as a Lithic Ustochrept.

Vegetation: Moderately dense cover of mesquite, juniper, yucca, tasajillo, and short to mid grasses and forbs.

Condition: Severely disturbed by sheet erosion.

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**Assessment:** The site appears to represent an aboriginal lithic procurement area. Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is quite large and exhibits a high density of cultural material, the context of that material has been virtually destroyed, and 41SN42 cannot be considered eligible for nomination to the National Register of Historic Places. However, surface collections of both modified and unmodified lithic materials from the site would provide useful data for a comparative study of aboriginal lithic raw material utilization in the area. These collections need not be conducted in a controlled manner since the present distribution of the cultural materials at the site is largely or entirely attributable to post-occupational disturbance.

**Recommendations:** Uncontrolled surface collection of comparative samples of both modified and unmodified lithic materials.

### 41SN43 (Southwest of Dam Site 19, Outside of Survey Area)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1725 feet/526 meters

Dimensions: Undetermined

**Location:** About 1 kilometer south of the pipeline route that is proposed to run between Dam Sites 14 and 19; at the head of a right-bank tributary to Pen Branch. The site is 1.8 kilometers west of the JMA Ranch house and 9.5 kilometers southwest of the outlet of Pen Branch Tank.

**Description:** A mastodon tusk was unearthed at this location in 1979 during the course of the excavation of a stock tank. Numerous heat-fractured dolomite and selenite fragments, small fragments of mammalian bone and ivory, and one small burinated chert biface were observed by the present survey on the spoil piles bordering the stock tank. The biface was collected (Appendix III).

**Physiography:** Along the channel of a small tributary draw with a basin of less than 2 square kilometers in a gently rolling upland area.

**Lithology:** Approximately 1 meter of Pleistocene valley fill, clay loam in texture, containing numerous angular dolomite and gypsum fragments, overlying shale of the Blaine Formation.

**Soil:** Vernon clay loam mapping unit. These soils are Typic Ustochrepts. The soil of the immediate site area is indeed a clay loam, but exhibits a mollic epipedon and a well-developed argillic horizon, and is more properly classified as a Typic Paleustoll.

**Vegetation:** The spoil piles and banks of the stock tank are devoid of vegetation. The immediate vicinity is covered by a rank growth of annual forbs. Scattered hackberry trees occur along the stream channel.

**Condition:** At least a part of the site has certainly been destroyed by construction of the stock tank. It is not known whether any of the cultural deposits remain intact.

**Assessment:** The available data suggest that a Paleo-indian component is present at 41SN43, and possibly consists of a mastodon kill associated with an occupation area. A major portion of the site was destroyed by the construction, but it is not possible to ascertain on the basis of present surface indications whether the entire cultural deposit was removed. If a significant portion of the deposit remains intact, 41SN43 will undoubtedly be found eligible for nomination to the National Register of Historic Places. Exploratory excavations are necessary for a more definitive assessment of the site.

**Recommendations:** The site will not be affected by the reservoir and pipeline construction as presently planned; testing and additional assessments are warranted if this site becomes endangered.

41SN44 (Dam Site 19, Survey Unit B-168)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1570 feet/479 meters

Dimensions: 30 meters N-S by 25 meters E-W

**Location:** In the central portion of the Dam Site 19 basin, at the head of a left-bank tributary of Wedington Creek. The site is 2.75 kilometers west of the confluence of Smelter and North Croton creeks and 2.05 kilometers west of the gaging station on North Croton Creek.

**Description:** Diffuse scatter of chipped stone cores, flakes and heat-altered quartzite. Debitage is primarily quartzite. Site area is relatively small; no discernible features or artifact concentrations were noted.

**Physiography:** Valley margin slope overlooking a short left-bank tributary of Wedington Creek, 9 meters above the former stream.

**Lithology:** Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

**Soil:** Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock is exposed at the surface over much of the site area.

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Vegetation: Sparse cover of juniper, featherplume, prickly pear, sumac, yucca, and various short grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN44 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN45 (Dam Site 19, Survey Unit B-171)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1560 feet/475 meters

Dimensions: 5 meters N-S by 5 meters E-W

Location: At the southwestern end of the Dam Site 19 basin, along the lower reaches of Wedington Creek. The site is 5.35 kilometers northwest of Kiowa Peak and 9.5 kilometers northwest of the confluence of Panther Canyon and the Brazos River.

Description: Discrete concentration of approximately 45 heat-fractured dolomite fragments, 1 chert dart point fragment, 2 chert bifaces, and approximately 20 chert tertiary flakes. No other cultural material was observed in the immediate vicinity. The chipped stone tools were collected; see Appendix III.

Physiography: Canyon rim overlooking Wedington Creek, 21 meters above the stream.

Lithology: Weathered silt loam sediment overlying gypsum of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate area is a gravelly silt loam containing numerous angular gypsum fragments and is classifiable as a Lithic Ustorthent.

Vegetation: Moderately dense cover of juniper, gramagrass and threeawn.

Condition: Severely disturbed by sheet erosion.



**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered fairly severe lateral displacement. The visible site area is extremely small, and the severe deflation of the surrounding area renders it very likely that the site boundaries have been accurately defined. Further investigations are not likely to produce additional significant data. The information yield potential of 41SN45 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

41SN46 (Dam Site 19, Survey Unit B-153)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: 100 meters N-S by 300 meters E-W

**Location:** At the southwestern end of the Dam Site 19 basin, along the middle reaches of Wedington Creek. The site is 6.35 kilometers west of Kiowa Peak and 10.2 kilometers northwest of the confluence of Panther Canyon and the Brazos River.

**Description:** Diffuse scatter of chipped stone tools, cores, flakes, ground stone tools, and heat-fractured dolomite. The chipped stone debitage is dominated by fine-grained quartzites with some chert also occurring. One biface and one edge-damaged flake were collected from the surface; see Appendix III. No features or artifact concentrations were observed.

**Physiography:** Canyon rim overlooking Wedington Creek, 18 meters above the stream.

**Lithology:** Shallow mantle of weathered silty sediments overlying dolomite of the Blaine Formation.

**Soil:** Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a silt loam, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out intermittently within the site.

**Vegetation:** Sparse cover of juniper, sumac, yucca, prickly pear, and grasses.

**Condition:** Severely disturbed by sheet erosion.

**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site covers a large area, the density of cultural material is very low and further investigations are not likely to produce additional significant data. The information yield potential of 41SN46 is

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low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN47 (Dam Site 19, Survey Unit B-153)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1610 feet/491 meters

Dimensions: 4 meters N-S by 2.5 meters E-W

Location: At the southwestern end of the Dam Site 19 basin, along the middle reaches of Wedington Creek. The site is 6.5 kilometers west of Kiowa Peak and 10.4 kilometers northwest of the confluence of Panther Canyon and the Brazos River.

Description: Discrete concentration of approximately 500 heat-fractured dolomite fragments. The concentration is now somewhat oval in shape, probably as a result of the downslope displacement of a portion of its contents. No other cultural material was observed in the vicinity. An adjacent dolomite outcrop is undoubtedly the source of the raw material.

Physiography: Upland slope overlooking Wedington Creek, 22 meters above the stream.

Lithology: Thinly interbedded silt and dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a flaggy silt loam, containing angular, tabular fragments of dolomite, classifiable as a Lithic Ustorthent.

Vegetation: Sparse cover of juniper, featherplume, threeawn grass and gramagrass.

Condition: Moderately disturbed by sheet erosion.

Assessment: The burned rock concentration appears to be completely deflated and to have suffered moderate downslope displacement of its contents. Despite the moderate to severe deflation of the surrounding area, no adjacent cultural remains were observed. It is highly unlikely that any additional buried cultural remains are present, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN47 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN48 (Dam Site 19, Survey Unit B-145)

USGS Quadrangle: 7.5' Kiowa Peak SW 1967

Elevation: 1595 feet/486 meters

Dimensions: 50 meters N-S by 20 meters E-W

Location: At the southwestern extremity of the Dam Site 19 basin, along the middle reaches of a major unnamed tributary of Wedington Creek. The site is 9.2 kilometers northeast of the junction of U.S. Route 83 and State Route 1263 and 10.35 kilometers northeast of the gaging station on the Salt Fork of the Brazos River.

Description: Diffuse scatter of chipped stone tools, cores, flakes, ground stone tool fragments, and heat-fractured dolomite. One concentration of such materials, presumably the deflated remains of a hearth, was observed at the northeastern end of the site. The feature measures 50 centimeters N-S by 38 centimeters E-W and contains 10 heat-fractured dolomite fragments, 2 heat-fractured quartzite fragments, 2 Ogallala quartzite cores (unburned), 6 Ogallala quartzite flakes (unburned), and 5 chert flakes (unburned). One planoconvex uniface was collected from the site (see Appendix III).

Physiography: Bedrock bench overlooking a major left-bank tributary of Wedington Creek, 12 meters above the former stream.

Lithology: Shallow mantle of weathered sandstone underlain by dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, featherplume, sumac, prickly pear, low grasses and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. Only one disturbed cultural feature was observed, and it is highly unlikely that additional buried features are present. Although the site is of moderate size, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN48 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

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Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN49 (Dam Site 19, Survey Unit B-145)

USGS Quadrangle: 7.5' Kiowa Peak SW 1967

Elevation: 1590 feet/485 meters

Dimensions: 20 meters N-S by 10 meters E-W

Location: At the southwestern extremity of the Dam Site 19 basin, along the middle reaches of a major left-bank tributary of Wedington Creek. The site is 9.1 kilometers northeast of the junction of U.S. Route 83 and State Route 1263 and 10.3 kilometers northeast of the gaging station on the Salt Fork of the Brazos River.

Description: Diffuse scatter of chipped stone cores and flakes, ground stone tool fragments and heat-fractured dolomite. One concentration of such materials, presumably the remains of a hearth, was observed at the northern end of the site. The feature measures 150 centimeters N-S by 125 centimeters E-W and contains approximately 150 heat-fractured dolomite fragments; 1 heat-fractured quartzite fragment; 2 heat-fractured sandstone fragments; and 1 abraded quartzite cobble (unburned). No other features or artifact concentrations were noted within the site.

Physiography: Bedrock bench overlooking a major left-bank tributary of Wedington Creek, 12 meters above the former stream.

Lithology: Shallow mantle of weathered sandstone underlain by dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Sparse cover of juniper, mesquite, yucca and prickly pear.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to severe lateral displacement. Only one disturbed cultural feature was observed, and it is highly unlikely that any additional buried features are present. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN49 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN50 (Dam Site 19, Survey Unit B-145)

USGS Quadrangle: 7.5' Kiowa Peak SW 1967

Elevation: 1595 feet/486 meters

Dimensions: 50 meters N-S by 50 meters E-W

Location: At the southwestern extremity of the Dam Site 19 basin, along the middle reaches of a major left-bank tributary of Wedington Creek. The site is 9.4 kilometers northeast of the junction of U.S. Route 83 and State Route 1263 and 10.6 kilometers northeast of the gaging station on the Salt Fork of the Brazos River.

Description: Diffuse scatter of chipped stone tools, cores and flakes, ground stone tools and tool fragments, and heat-fractured rocks. The chipped stone materials are dominated by Ogallala quartzite and cherts, and the burned rock is primarily dolomite. Ten concentrations of such materials, designated F-1 through F-10, were recorded (Table 30). F-1 through F-3 are clustered at the southeastern end of the site, and F-4 through F-10 at its northwestern extremity. Within each cluster, the features are evenly spaced at 1 to 2 meters apart. One biface failure and one dart point, classifiable as type Castroville, were collected (Appendix III).

Physiography: Bedrock bench overlooking a major left-bank tributary of Wedington Creek, 12 meters above the former stream.

Lithology: Shallow mantle of weathered sandstone underlain by dolomite of the Blaine Formation.

Soil: Cottonwood-Owens Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Juniper, mesquite, prickly pear and scattered grasses.

Condition: Moderately to severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered moderate to locally severe lateral displacement. Ten deflated cultural features were recorded by the present survey, but it is highly unlikely that additional buried cultural features are present. Although the site is moderately large in size, the overall density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN50 seems low, and the site is not considered eligible for nomination to the National Register of Historic Places.

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TABLE 30  
FEATURE DESCRIPTIONS, 41SN50

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- F-1: Dimensions: 20 centimeters in diameter  
Contents: 4 heat-fractured gray, fine-grained quartzite cobble fragments; 2 heat-fractured dolomite fragments; 1 Ogallala quartzite flake (unburned).
- F-2: Dimensions: 20 centimeters in diameter  
Contents: 6 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 1 heat-fractured silicified wood cobble fragment; 1 heat-fractured dolomite fragment.
- F-3: Dimensions: 25 centimeters in diameter  
Contents: 3 heat-fractured gray, fine-grained quartzite cobble fragments; 1 heat-fractured Ogallala quartzite fragment; 2 heat-fractured dolomite fragments; 2 chert flakes (unburned).
- F-4: Dimensions: 1.5 meters in diameter  
Contents: Approximately 100 heat-fractured dolomite fragments; 3 heat-fractured gray, fine-grained quartzite cobble fragments; 3 Ogallala quartzite flakes (unburned); 5 chert flakes (unburned); 2 fine-grained quartzite abraded cobble fragments (unburned).
- F-5: Dimensions: 1.2 meters N-S by 1.6 meters E-W  
Contents: Approximately 75 heat-fractured dolomite fragments; 1 burned, coarse-grained quartzite cobble.
- F-6: Dimensions: 50 centimeters in diameter  
Contents: Approximately 25 heat-fractured dolomite fragments; 5 heat-fractured gray, fine-grained quartzite cobble fragments; 2 chert flakes (unburned).
- F-7: Dimensions: 1.2 meters N-S by 50 centimeters E-W  
Contents: Approximately 40 heat-fractured dolomite fragments; 9 heat-fractured gray and purple, fine-grained quartzite cobble fragments; 4 Ogallala quartzite flakes (unburned); 2 chert flakes (unburned); 1 medium-grained quartzite abraded cobble (unburned).
- F-8: Dimensions: 60 centimeters N-S by 100 centimeters E-W  
Contents: Approximately 20 heat-fractured dolomite fragments and 1 burned quartzite cobble.
- F-9: Dimensions: 6 meters N-S by 2 meters E-W  
Contents: Approximately 100 heat-fractured dolomite fragments.
- F-10: Dimensions: 50 centimeters N-S by 100 centimeters E-W  
Contents: Approximately 20 heat-fractured dolomite fragments; 3 heat-fractured gray, fine-grained quartzite cobble fragments; 3 Ogallala quartzite flakes (unburned); 2 chert flakes (unburned); 1 fine-grained quartzite abraded cobble fragment (unburned).
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Recommendations: Further work is felt not to be scientifically productive at this time.

41SN51 (Dam Site 10, Survey Unit B-46)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1815 feet/553 meters

Dimensions: 9 meters N-S by 21 meters E-W

Location: At the eastern end of the Dam Site 10 basin, along the middle reaches of a left-bank tributary of Croton Creek. The site is 4.5 kilometers west of Starcher Windmill and 4.9 kilometers northwest of Patterson Windmill.

Description: Diffuse scatter of chipped stone cores, flakes and heat-fractured quartz and quartzite. Debitage is primarily of quartzite with some chert. Site is relatively small. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of Croton Creek, 18 meters above the former stream.

Lithology: Shallow mantle of alluvial sandy loam and gravel, deriving from the Quaternary 35-meter Croton Creek strath terrace, overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over most of the site area.

Vegetation: Sparse cover of yucca, broomweed, threeawn and grama-grass.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN51 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN52 (Dam Site 10, Survey Unit B-46)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

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Elevation: 1805 feet/550 meters

Dimensions: 40 meters N-S by 100 meters E-W

Location: At the eastern end of the Dam Site 10 basin, along the middle reaches of a left-bank tributary to Croton Creek. The site is 5.1 kilometers northwest of Patterson Windmill and 4.6 kilometers west of Starcher Windmill.

Description: Diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. Debitage is dominated by chert with some quartzite. Site area is of moderate size; no discernible features or artifact concentrations were observed.

Physiography: Canyon rim overlooking a minor left-bank tributary of Croton Creek, 18 meters above the former stream.

Lithology: Shallow mantle of alluvial sandy loam and gravel, deriving from the Quaternary 35-meter Croton Creek strath terrace, overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margin of the site.

Vegetation: Sparse cover of mesquite, yucca, threeawn and grama-grass.

Condition: Severely disturbed by sheet and rill erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site covers a fairly large area, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN52 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN53 (Dam Site 10, Survey Unit B-46)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800 feet/549 meters

Dimensions: 8 meters N-S by 14 meters E-W

Location: At the eastern end of the Dam Site 10 basin, along the middle reaches of a left-bank tributary of Croton Creek. The site is



4.68 kilometers west of Starcher Windmill and 5.1 kilometers northwest of Patterson Windmill.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. Debitage is of chert and quartzite. Site area is very small. No discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of Croton Creek, 18 meters above the former stream.

Lithology: Shallow mantle of alluvial sandy loam and gravel, deriving from the Quaternary 35-meter Croton Creek strath terrace, overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margins of the site area.

Vegetation: Sparse cover of grasses, forbs and hackberry.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is quite small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN53 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN54 (Dam Site 10, Survey Unit B-46)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1790 feet/546 meters

Dimensions: 100 meters N-S by 250 meters E-W

Location: At the eastern end of the Dam Site 10 basin, at the confluence of two minor left-bank tributaries of Croton Creek. The site is 4.65 kilometers west of Starcher Windmill and 3.45 kilometers northwest of Twin Windmills.

Description: Diffuse scatter of chipped stone tools, cores, flakes and heat-fractured quartzite within a gravel exposure. One dart point was collected (Appendix III). Debitage is primarily chert with some

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quartzite. Site area is relatively large; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking the confluence of two minor left-bank tributaries of Croton Creek, 12 meters above the former stream.

Lithology: Shallow mantle of colluvial sandy loam and gravel, washed down from an upslope exposure of the Quaternary 35-meter Croton Creek strath terrace, overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out over most of the site area.

Vegetation: Sparse cover of threeawn grass, gramagrass and forbs.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site covers a large area, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN54 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN55 (Dam Site 10, Survey Units B-55 and B-56)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1825 feet/556 meters

Dimensions: 550 meters NW-SE by 75 meters SW-NE

Location: At the eastern end of the Dam Site 10 basin, along the middle reaches of a minor left-bank tributary of Croton Creek. The site is 5.3 kilometers northwest of Patterson Windmill and 4.9 kilometers west of Starcher Windmill.

Description: Moderately dense scatter of tested cobbles, cores and flakes associated with a lag gravel concentration. Cores are relatively numerous, and the flakes are predominantly corticate or partially decorticate. Ogallala quartzite and chert dominate the debitage. No features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of Croton Creek, 24 to 26 meters above the former stream.

Lithology: Alluvial sandy loam and gravel, deriving from the Quaternary 21-to-24-meter Croton Creek strath terrace.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a very gravelly sandy loam, classifiable as a Lithic Ustochrept.

Vegetation: Sparse to moderate cover of threeawn grass, gramagrass and yucca.

Condition: Severely disturbed by sheet erosion.

Assessment: The site is almost certainly an aboriginal lithic procurement area. Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site covers a very large area and the density of cultural material is fairly high, the context of that material has been completely destroyed, and the site cannot be considered eligible for nomination to the National Register of Historic Places. However, 41SN55 could provide useful data on aboriginal lithic raw material selection and utilization through the collection of comparative samples of both modified and unmodified lithic materials.

Recommendations: Surface collections of both modified and unmodified lithic materials should be made. The present distribution of cultural material is largely or entirely attributable to post-occupational disturbance, and the collections therefore need not be taken in a controlled manner. Given the volume of material present at the site, it is suggested that samples be taken.

41SN56 (Dam Site 10, Survey Units B-55 and B-56)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1825 feet/556 meters

Dimensions: 825 meters NW-SE by 100 meters NE-SW

Location: At the eastern end of the Dam Site 10 basin, along the middle reaches of a minor left-bank tributary of Croton Creek. The site is 5.5 kilometers northwest of Patterson Windmill and 5.2 kilometers west of Starcher Windmill.

Description: Diffuse scatter of tested cobbles, cores and flakes. Cores are proportionately numerous, and the flakes are predominantly corticate or partially decorticate. Ogallala quartzite and various cherts dominate the debitage. No features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of Croton Creek, 18 to 21 meters above the former stream.

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Lithology: Alluvial sandy loam and gravel, deriving from the Quaternary 21-to-24-meter Croton Creek strath terrace.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a very gravelly sandy loam, classifiable as a Lithic Ustochrept.

Vegetation: Sparse to moderate cover of threeawn grass, grama-grass, forbs, yucca, mesquite and juniper.

Condition: Severely disturbed by sheet and rill erosion.

Assessment: Like 41SN55, the site appears to represent an aboriginal lithic procurement area. The cultural material at 41SN56 is virtually identical to that at 41SN55 but occurs at a much lower density. Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The context of the cultural material has been entirely destroyed, and the site cannot be considered eligible for nomination to the National Register of Historic Places. Given the low density of cultural material at 41SN56, the site does not warrant surface collection like that recommended for 41SN55.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN57 (Dam Site 10, Survey Unit B-42)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1780 feet/543 meters

Dimensions: 8 meters N-S by 5 meters E-W

Location: At the southeastern end of the Dam Site 10 basin, at the lower end of Salt Creek. The site is 3.7 kilometers southwest of Patterson Windmill and 3.9 kilometers southwest of Starcher Windmill.

Description: Diffuse scatter of chipped stone flakes and one arrow point similar to the type Cuney. The arrow point was collected (Appendix III). All of the debitage is of local chert. The site is extremely small, and no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking Salt Creek, 21 meters above the stream.

Lithology: Shallow mantle of colluvial sandy loam and gravel, washed down from an upslope exposure of the Quaternary 35-meter Croton Creek strath terrace.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly sandy loam, classifiable as a Typic Ustochrept.

Vegetation: Moderately dense cover of mesquite, grasses, mormon tea, prickly pear and broomweed.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is extremely small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN57 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN58 (Dam Site 10, Survey Unit B-31)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1835 feet/559 meters

Dimensions: 15 meters N-S by 20 meters E-W

Location: At the southern extremity of the Dam Site 10 basin, along the middle reaches of Salt Creek. The site is 2.4 kilometers southwest of Perry Windmill and 4.9 kilometers west of the Golden Pond School.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. A planoconvex uniface and an edge-damaged flake were collected (Appendix III). Lithics are of chert and quartzite. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Valley margin slope overlooking Salt Creek, 18 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Quinlan very fine sandy loam, classifiable as a Typic Ustochrept.

Vegetation: Moderately dense cover of mesquite, thistles, catclaw, mormon tea, tasajillo and grasses.

Condition: Severely disturbed by sheet erosion.

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**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small in area, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN58 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### 41SN59 (Dam Site 10, Survey Unit A-53)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1790 feet/546 meters

Dimensions: 40 meters N-S by 15 meters E-W

**Location:** At the eastern end of the Dam Site 10 basin, along the lower reaches of Croton Creek. The site is 3.5 kilometers southwest of Starcher Windmill and 3.5 kilometers west of Patterson Windmill.

**Description:** Diffuse scatter of chipped stone cores and flakes, and heat-fractured quartzite. Lithics are predominantly quartzite. Site area is of moderate size; no discernible features or artifact concentrations were noted.

**Physiography:** Valley margin slope overlooking Croton Creek, 24 meters above the stream.

**Lithology:** Lag concentration of stream-rolled gravels, probably deriving from the Quaternary 35-meter strath terrace of Croton Creek, overlying poorly consolidated sandstone of the Whitehorse Group. The gravel concentration incorporating 41SN59 has been separately documented as locality L41SN41.

**Soil:** Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly very fine sandy loam, classifiable as a Lithic Torriorthent.

**Vegetation:** Scattered juniper, thistles, prickly pear and low grasses.

**Condition:** Severely disturbed by sheet and gully erosion.

**Assessment:** Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is of moderate size, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN59 is low, and

the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN60 (Dam Site 10, Survey Unit A-44)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1815 feet/553 meters

Dimensions: 50 meters N-S by 60 meters E-W

Location: At the eastern end of the Dam Site 10 basin, at the lower end of a deep ravine bordering the right bank of Croton Creek. The site is 4.9 kilometers southwest of Starcher Windmill and 3 kilometers west of Twin Windmills.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. One biface manufacturing failure was collected (Appendix III). Debitage is primarily quartzite with some chert. Site is moderately large in size; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a small, deep ravine bordering the right bank of Croton Creek, 25 meters above the floor of the ravine.

Lithology: Shallow mantle of weathered sandstone, underlain by gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Sparse cover of thistles, prickly pear, tasajillo and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is of moderate size, the density of cultural material is fairly low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN60 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

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41SN61 (Dam Site 10, Survey Unit A-44)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1810 feet/552 meters

Dimensions: 10 meters N-S by 20 meters E-W

Location: At the eastern end of the Dam Site 10 basin, at the lower end of a deep ravine which borders the right bank of Croton Creek. The site is 5.1 kilometers southwest of Starcher Windmill and 3.2 kilometers west of Twin Windmills.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. One dart point was collected (Appendix III). Debitage is of chert. Site size is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a small, deep ravine bordering the right bank of Croton Creek, 25 meters above the floor of the ravine.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the streamward margin of the site area.

Vegetation: Sparse cover of yucca and low grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small in area, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN61 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN62 (Dam Site 10, Survey Unit B-35)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1825 feet/556 meters

Dimensions: 30 meters N-S by 40 meters E-W



Location: In the southern portion of the Dam Site 10 basin, along the middle reaches of Salt Creek. The site is 1.6 kilometers northwest of Perry Windmill and 3.8 kilometers southwest of Twin Windmills.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. One dart point, similar to the type Martindale, was collected (Appendix III). Debitage is of quartzite. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Valley margin slope overlooking Salt Creek, 24 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Juniper, tasajillo, thistles, prickly pear and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely disturbed and have suffered severe lateral displacement. The site is fairly small in area, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN62 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN63 (Dam Site 10, Survey Unit A-34)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800 feet/549 meters

Dimensions: 30 meters NW-SE by 10 meters NE-SW

Location: In the central portion of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 1.1 kilometers northeast of the confluence of Panther and Croton creeks and 1.7 kilometers east of the confluence of Short Croton and Croton creeks.

Description: Diffuse scatter of chipped stone cores and flakes, and heat-fractured quartzite. Debitage is Ogallala quartzite. Site area is relatively small; no discernible features or artifact concentrations were noted.

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Physiography: Canyon rim overlooking Croton Creek, 20 meters above the stream.

Lithology: Alluvium of the third (12-meter) terrace above Croton Creek, a gravelly fine sandy loam in texture. The terrace remnant has been separately documented as locality L41KT9.

Soil: Quinlan-Rough Broken Land Complex mapping unit. Soil of the immediate site area is a gravelly fine sandy loam, classifiable as a Typic Torriorthent.

Vegetation: Juniper, yucca, grasses and forbs.

Condition: Severely disturbed by sheet and rill erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small in area, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN63 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN64 (Dam Site 14, Survey Unit C-33)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1660 feet/506 meters

Dimensions: 5 meters N-S by 5 meters E-W

Location: At the eastern extremity of the Dam Site 14 basin, at the lower end of a left-bank tributary to Salt Croton Creek. The site is 1.9 kilometers southeast of the confluence of Southerland Canyon and Salt Croton Creek and 3.78 kilometers southeast of the gaging station on Salt Croton Creek.

Description: Diffuse scatter of chipped stone cores, flakes and heat-fractured quartzite. One retouched flake was collected (Appendix III). Debitage is of quartzite and petrified wood. Site area is extremely small; no discernible features or artifact concentrations were noted.

Physiography: Second fill terrace above Salt Croton Creek, 9 meters above the stream.

Lithology: Alluvium of the second (6-to-9-meter) fill terrace above Salt Croton Creek, a fine sandy loam in texture.

Soil: Flood stage erosion by Salt Croton Creek has scoured the terrace surface and has substantially lowered the elevation of its tread in the recent past. There is virtually no soil development in the vicinity of the site; rather, the surface consists of freshly exposed terrace fill.

Vegetation: Moderately dense cover of juniper, mesquite, thistle, threeawn grasses and forbs.

Condition: Severely disturbed by sheet and gully erosion.

Assessment: Given the apparent late Holocene origin of the terrace fill (Appendix V), one would assume that this component is of Late Pre-historic or Historic age. Surface indications suggest that the cultural deposits were shallowly buried below the terrace tread at one time but have been recently exposed and completely deflated, suffering severe lateral displacement. There is no indication of the presence of additional buried cultural remains in the vicinity. The site is very small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN64 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN65 (Pipeline, Survey Unit C-37)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1805 feet/550 meters

Dimensions: 70 meters N-S by 100 meters E-W

Location: At the western extremity of the pipeline running between Dam Sites 14 and 19, along the middle reaches of a minor left-bank tributary of Salt Croton Creek. The site is 1.9 kilometers south of the Sonny microwave tower and 5.15 kilometers southwest of the Martin Ranch house.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. Six concentrations of burned rock were observed to be associated with bulldozer spoil piles. One biface manufacturing failure was collected (Appendix III). Debitage is of chert and Ogallala quartzite. Site area is relatively large.

Physiography: Bedrock bench overlooking a minor left-bank tributary of Salt Croton Creek, 30 meters above the stream.

Lithology: Shallow mantle of weathered sandstone overlying gypsum of the Blaine Formation.

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Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Gypsum bedrock crops out along the margins of the site area.

Vegetation: Moderate cover of juniper, mesquite, yucca, tasajillo and low grasses.

Condition: Severely disturbed by machine brush clearing and sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. All of the observed concentrations of cultural material were clearly associated with spoil piles resulting from machine brush clearing. Although the site is relatively large, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN65 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: No further work is warranted.

### 41SN66 (Pipeline, North of Survey Unit C-45)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1700 feet/518 meters

Dimensions: 38 meters N-S by 38 meters E-W

Location: At the western end of the pipeline running between Dam Sites 14 and 19, along the middle reaches of Bob Creek. The site is 3.62 kilometers southeast of the Sonny microwave tower and 2.15 kilometers southwest of the Martin Ranch house.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. One laterally retouched flake was collected (Appendix III). Lithics are primarily Ogallala quartzite with some chert. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Bedrock bench overlooking Bob Creek, 21 meters above the stream.

Lithology: Shallow mantle of silt overlying dolomite of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a silt loam, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Mesquite, broomweed, tasajillo, juniper, prickly pear, yucca, agarita and grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is relatively small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN66 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN67 (Pipeline, Survey Unit C-44)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1790 feet/546 meters

Dimensions: 65 meters N-S by 53 meters E-W

Location: At the western end of the pipeline running between Dam Sites 14 and 19, along the middle reaches of Bob Creek. The site is 3.6 kilometers southwest of the Sonny microwave tower and 2.25 kilometers southwest of the Martin Ranch house.

Description: Diffuse scatter of chipped stone cores and flakes, and heat-fractured dolomite. Debitage is of Ogallala quartzite and chert. Site area is of moderate size; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking Bob Creek, 21 meters above the stream.

Lithology: Shallow mantle of silt overlying dolomite of the Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a silt loam, classifiable as a Lithic Ustorthent. Dolomite bedrock crops out over much of the site area.

Vegetation: Moderately dense cover of juniper, broomweed, threeawn and other grasses.

Condition: Severely disturbed by sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely deflated and have suffered severe lateral displacement. Although the site is of moderate size, the density of cultural material is

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low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN67 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41SN68 (Pipeline, Survey Unit C-53)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1720 feet/524 meters

Dimensions: 75 meters N-S by 150 meters E-W

Location: At the western end of the pipeline running between Dam Sites 14 and 19, at the upper end of an unnamed left-bank tributary of the Salt Fork of the Brazos River. The site is 2.3 kilometers southeast of the Martin Ranch house and 6.8 kilometers southeast of the Sonny microwave tower.

Description: Diffuse scatter of chipped stone tools, cores and flakes, and heat-fractured quartzite. One concentration of burned gypsum and quartzite, 200 centimeters N-S by 75 centimeters E-W, was noted at the northeastern end of the site and presumably represents the remains of a severely disturbed hearth. Chipped stone materials are primarily quartzite. Site area is relatively large.

Physiography: Canyon rim overlooking a minor left-bank tributary of the Salt Fork of the Brazos River, 12 meters above the former stream.

Lithology: Poorly consolidated sandstone, Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Juniper, mesquite, prickly pear and grasses.

Condition: Severely disturbed by machine brush clearing and sheet erosion.

Assessment: Surface indications suggest the cultural deposits are completely deflated and have suffered severe lateral displacement. The single observed cultural feature is severely disturbed, and it is highly unlikely that any additional features lie buried within the site. Although the site covers a large area, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN68 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

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Recommendations: Further work is felt not to be scientifically productive at this time.

41SN69 (Pipeline, Survey Unit C-53)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1720 feet/524 meters

Dimensions: 22 meters N-S by 17 meters E-W

Location: At the western end of the pipeline running between Dam Sites 14 and 19, at the upper end of an unnamed left-bank tributary of the Salt Fork of the Brazos River. The site is 2.25 kilometers southeast of the Martin Ranch house and 6.6 kilometers southeast of the Sonny microwave tower.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. Flakes are of chert. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of the Salt Fork of the Brazos River, 12 meters above the former stream.

Lithology: Poorly consolidated sandstone, Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Juniper, prickly pear, mesquite, yucca and sumac.

Condition: Severely disturbed by machine brush clearing and sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is small, the density of cultural material is very low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN69 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN70 (Pipeline, Survey Unit C-52)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1720 feet/524 meters

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Dimensions: 22 meters N-S by 17 meters E-W

Location: At the western end of the pipeline running between Dam Sites 14 and 19, at the upper end of an unnamed left-bank tributary of the Salt Fork of the Brazos River. The site is 2.15 kilometers south-east of the Martin Ranch house and 6.45 kilometers southeast of the Sonny microwave tower.

Description: Diffuse scatter of chipped stone flakes and heat-fractured quartzite. Debitage is predominantly chert. Site area is relatively small; no discernible features or artifact concentrations were noted.

Physiography: Canyon rim overlooking a minor left-bank tributary of the Salt Fork of the Brazos River, 12 meters above the former stream.

Lithology: Poorly consolidated sandstone, Blaine Formation.

Soil: Owens-Badland Association mapping unit. Soil of the immediate site area is a fine sandy loam, classifiable as a Lithic Torriorthent. Sandstone bedrock crops out over much of the site area.

Vegetation: Juniper, prickly pear, sumac, mesquite and low grasses.

Condition: Severely disturbed by machine brush clearing and sheet erosion.

Assessment: Surface indications suggest that the cultural deposits are completely deflated and have suffered severe lateral displacement. The site is small, the density of cultural material is low, and further investigations are not likely to produce additional significant data. The information yield potential of 41SN70 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.



TABLE 31  
SUMMARY OF PREHISTORIC SITE DESCRIPTIONS, ASSESSMENTS AND RECOMMENDATIONS

| Site No. | Location    | Description                                     | Assessment  | Recommendations                    |
|----------|-------------|---|---|------------------------------------|
| 41KT5    | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time               |
| 41KT6    | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time               |
| 41KT7    | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Small, deflated;<br>low potential                             | No work at this time               |
| 41KT8    | Dam Site 10 | Dense lithic scatter;<br>no features            | Moderate size, rela-<br>tively undisturbed;<br>high potential | Limited excavation                 |
| 41KT9    | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time               |
| 41KT10   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time               |
| 41KT11   | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Large, deflated;<br>limited potential                         | Uncontrolled surface<br>collection |
| 41KT12   | Dam Site 10 | Moderately dense lithic<br>scatter; one feature | Moderate size,<br>deflated; limited<br>potential              | Uncontrolled surface<br>collection |
| 41KT13   | Dam Site 10 | Diffuse lithic scatter;<br>one feature          | Small, deflated;<br>low potential                             | No work at this time               |

Table 31, continued

| Site No. | Location    | Description                                     | Assessment  | Recommendations                    |
|----------|-------------|---|---|------------------------------------|
| 41KT14   | Dam Site 10 | Diffuse lithic scatter;<br>one feature          | Small, deflated;<br>low potential                                       | No work at this time               |
| 41KT15   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                                       | No work at this time               |
| 41KT16   | Dam Site 10 | Dense lithic scatter;<br>no features            | Moderate size,<br>eroded; limited<br>potential                          | Uncontrolled surface<br>collection |
| 41KT17   | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Moderate size,<br>partially disturbed;<br>moderate to high<br>potential | Limited excavation                 |
| 41KT18   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Moderate size,<br>deflated; low<br>potential                            | No work at this time               |
| 41KT19   | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Large, deflated;<br>limited potential                                   | Uncontrolled surface<br>collection |
| 41KT21   | Dam Site 10 | Dense lithic scatter;<br>one feature            | Large, partially<br>deflated; moderate<br>to high potential             | Limited excavation                 |
| 41KT23   | Dam Site 10 | Diffuse lithic scatter;<br>one feature          | Moderate size,<br>deflated; low<br>potential                            | No work at this time               |
| 41KT24   | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Large, partially<br>deflated; moderate<br>to high potential             | Limited excavation                 |

Table 31, continued

| Site No. | Location    | Description                                     | Assessment                                       | Recommendations                    |
|----------|-------------|---|--|------------------------------------|
| 41KT25   | Dam Site 10 | One feature                                     | Small, deflated;<br>low potential                | No work at this time               |
| 41KT26   | Dam Site 10 | One feature                                     | Small, deflated;<br>low potential                | No work at this time               |
| 41KG24   | Dam Site 19 | Moderately dense lithic<br>scatter; no features | Moderate size,<br>deflated; limited<br>potential | Uncontrolled surface<br>collection |
| 41KG25   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Large, deflated;<br>low potential                | No work at this time               |
| 41KG26   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |
| 41KG27   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |
| 41KG28   | Dam Site 19 | Moderately dense lithic<br>scatter; no features | Small, deflated;<br>low potential                | No work at this time               |
| 41KG29   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |
| 41KG30   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |
| 41KG31   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |
| 41KG32   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                | No work at this time               |

Table 31, continued

| Site No. | Location    | Description                            | Assessment  | Recommendations                |
|----------|-------------|--|---|--------------------------------|
| 41KG33   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                       | No work at this time           |
| 41KG34   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Large, deflated;<br>low potential                       | No further work                |
| 41KG35   | Dam Site 19 | Isolated find; no features             | Large, deflated;<br>low potential                       | No further work                |
| 41KG36   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Large, deflated;<br>low potential                       | No work at this time           |
| 41KG37   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                       | No work at this time           |
| 41KG38   | Dam Site 19 | Diffuse lithic scatter;<br>features    | Moderate size,<br>partially deflated;<br>high potential | Mapping, limited<br>excavation |
| 41KG39   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Small, virtually<br>destroyed; low<br>potential         | No work at this time           |
| 41KG40   | Dam Site 19 | Isolated find; no features             | Small, deflated;<br>low potential                       | No further work                |
| 41KG41   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                       | No work at this time           |
| 41KG42   | Dam Site 19 | Diffuse lithic scatter;<br>no features | Large, deflated;<br>low potential                       | No work at this time           |

Table 31, continued

| Site No. | Location    | Description                                       | Assessment                                   | Recommendations      |
|----------|-------------|---|--|----------------------|
| 41KG44   | Dam Site 19 | Diffuse lithic scatter;<br>no features            | Small, deflated;<br>low potential            | No further work      |
| 41KG45   | Dam Site 14 | Diffuse lithic scatter;<br>one feature            | Small, deflated;<br>low potential            | No work at this time |
| 41KG46   | Dam Site 14 | Diffuse lithic scatter;<br>no features            | Moderate size,<br>deflated; low<br>potential | No work at this time |
| 41KG47   | Dam Site 14 | Diffuse lithic scatter;<br>no features            | Large, minimal ero-<br>sion; high potential  | Limited excavation   |
| 41KG48   | Dam Site 14 | Diffuse lithic scatter;<br>no features            | Large, deflated;<br>low potential            | No work at this time |
| 41KG49   | Dam Site 14 | Diffuse lithic and shell<br>scatter; no features  | Large, deflated;<br>low potential            | No work at this time |
| 41KG50   | Dam Site 14 | Extensive, diffuse lithic<br>scatter; no features | Large, redeposited;<br>low potential         | No work at this time |
| 41KG51   | Dam Site 19 | Diffuse lithic scatter;<br>no features            | Small, deflated;<br>low potential            | No work at this time |
| 41KG52   | Dam Site 19 | Diffuse lithic scatter;<br>no features            | Moderate size,<br>deflated; low<br>potential | No work at this time |
| 41KG53   | Dam Site 19 | Diffuse lithic scatter;<br>no features            | Large, deflated;<br>low potential            | No work at this time |

Table 31, continued

| Site No. | Location    | Description                                     | Assessment  | Recommendations  |
|----------|-------------|---|---|--|
| 41KG54   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time                                     |
| 41KG55   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Moderate size,<br>deflated; low<br>potential                  | No work at this time                                     |
| 41KG58   | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Moderate size,<br>deflated; low<br>potential                  | No work at this time                                     |
| 41KG59   | Dam Site 19 | Isolated find; no features                      | Small, deflated;<br>low potential                             | No further work  |
| 41KG62   | Dam Site 14 | Moderately dense lithic<br>scatter; one feature | Small, deflated;<br>low potential                             | No work at this time                                     |
| 41SN3    | Dam Site 19 | Diffuse lithic scatter;<br>features             | Small, deflated;<br>low potential                             | No work at this time                                     |
| 41SN4    | Dam Site 19 | Moderately dense lithic<br>scatter; features    | Size unknown; minor<br>erosion; moderate<br>to high potential | Reassessment; possible<br>mapping, limited<br>excavation |
| 41SN5    | Dam Site 19 | Diffuse lithic scatter;<br>features             | Small, deflated;<br>low potential                             | No work at this time                                     |
| 41SN6    | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time                                     |
| 41SN7    | Dam Site 19 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential                             | No work at this time                                     |

Table 31, continued

| Site No. | Location    | Description                            | Assessment  | Recommendations  |
|----------|-------------|--|---|--|
| 41SN8    | Dam Site 19 | Diffuse lithic scatter;<br>features    | Moderate size,<br>deflated; low<br>potential                | No work at this time   |
| 41SN9    | Dam Site 19 | Diffuse lithic scatter;<br>one feature | Small, deflated;<br>low potential                           | No work at this time   |
| 41SN10   | Dam Site 10 | Diffuse lithic scatter;<br>one feature | Small, deflated;<br>low potential                           | No work at this time   |
| 41SN11   | Dam Site 10 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                           | No work at this time   |
| 41SN12   | Dam Site 10 | Dense lithic scatter;<br>no features   | Large, deflated;<br>limited potential                       | Controlled surface<br>collection   |
| 41SN13   | Dam Site 10 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                           | No work at this time   |
| 41SN14   | Dam Site 10 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential                           | No work at this time   |
| 41SN15   | Dam Site 14 | Dense lithic scatter;<br>features      | Large, partially<br>deflated; high<br>potential             | Reassessment, mapping;<br>possibly controlled<br>collection and/or<br>limited excavation |
| 41SN16   | Dam Site 14 | Dense lithic scatter;<br>features      | Large, partially<br>deflated; moderate<br>to high potential | Reassessment, mapping;<br>possibly controlled<br>collection and/or<br>limited excavation |

Table 31, continued

| Site No. | Location    | Description                                      | Assessment  | Recommendations             |
|----------|-------------|--|---|-----------------------------|
| 41SN17   | Dam Site 19 | Extensive, diffuse lithic scatter; no features   | Large, deflated; low potential                        | No work at this time        |
| 41SN18   | Dam Site 19 | Diffuse lithic scatter; one feature              | Moderate size, deflated; low potential                | No work at this time        |
| 41SN19   | Dam Site 19 | Diffuse lithic scatter; possible feature         | Small, deflated; low potential                        | No work at this time        |
| 41SN20   | Dam Site 19 | Diffuse lithic scatter; features                 | Large, deflated; low potential                        | No work at this time        |
| 41SN21   | Dam Site 19 | Diffuse lithic scatter; one feature              | Small, deflated; low potential                        | No work at this time        |
| 41SN22   | Dam Site 19 | One feature                                      | Small, deflated; low potential                        | No work at this time        |
| 41SN23   | Dam Site 19 | Diffuse lithic scatter; one feature              | Moderate size, deflated; low potential                | No work at this time        |
| 41SN24   | Dam Site 19 | One feature                                      | Small, deflated; low potential                        | No work at this time        |
| 41SN25   | Dam Site 19 | Diffuse lithic scatter; one feature              | Large, deflated; low potential                        | No work at this time        |
| 41SN27   | Dam Site 19 | Diffuse lithic, bone and shell scatter; features | Large, partially deflated; moderate to high potential | Mapping, limited excavation |



Table 31, continued

| Site No. | Location    | Description  | Assessment  | Recommendations                 |
|----------|-------------|--|---|---------------------------------|
| 41SN28   | Dam Site 19 | Diffuse lithic scatter;<br>no features                   | Small, deflated;<br>low potential                           | No further work                 |
| 41SN29   | Dam Site 19 | Isolated find  | Small, deflated;<br>low potential                           | No further work                 |
| 41SN30   | Dam Site 19 | Diffuse lithic scatter;<br>features                      | Moderate size,<br>deflated; low<br>potential                | No work at this time            |
| 41SN31   | Dam Site 19 | Discrete lithic scatter;<br>no features                  | Small, deflated;<br>low potential                           | No work at this time            |
| 41SN32   | Dam Site 19 | Discrete lithic scatter;<br>no features                  | Small, deflated;<br>low potential                           | No work at this time            |
| 41SN33   | Dam Site 19 | Diffuse lithic scatter;<br>features                      | Large, partially<br>deflated; moderate<br>to high potential | Mapping, limited<br>excavations |
| 41SN34   | Dam Site 19 | Diffuse lithic scatter;<br>features                      | Large, partially<br>deflated; moderate<br>to high potential | Mapping, limited<br>excavations |
| 41SN35   | Dam Site 19 | Extensive, diffuse lithic<br>and shell scatter; features | Large, partially<br>deflated; moderate<br>to high potential | Mapping, limited<br>excavations |
| 41SN36   | Dam Site 14 | Diffuse lithic scatter;<br>no features                   | Small, deflated;<br>low potential                           | No work at this time            |
| 41SN37   | Dam Site 14 | Isolated find  | Small, deflated;<br>low potential                           | No work at this time            |

Table 31, continued

| Site No. | Location    | Description   | Assessment   | Recommendations  |
|----------|-------------|---|--|--|
| 41SN38   | Dam Site 14 | One feature   | Small, deflated;<br>low potential  | No work at this time   |
| 41SN39   | Dam Site 14 | One feature   | Small, deflated;<br>low potential  | No work at this time   |
| 41SN40   | Dam Site 14 | Extensive, diffuse lithic<br>scatter; no features           | Large, redeposited;<br>low potential                                     | No work at this time   |
| 41SN41   | Dam Site 14 | Diffuse lithic scatter;<br>one feature                      | Moderate size;<br>deflated; low<br>potential                             | No work at this time   |
| 41SN42   | Dam Site 14 | Moderately dense lithic<br>scatter; no features             | Large, deflated;<br>limited potential                                    | Uncontrolled surface<br>collection                           |
| 41SN43   | Dam Site 19 | Moderately dense lithic<br>and bone scatter; no<br>features | Size undetermined,<br>partially destroyed;<br>possibly high<br>potential | Limited testing and<br>reassessment if site<br>is endangered |
| 41SN44   | Dam Site 19 | Diffuse lithic scatter;<br>no features                      | Small, deflated;<br>low potential  | No work at this time   |
| 41SN45   | Dam Site 19 | Discrete lithic scatter;<br>no features                     | Small, deflated;<br>low potential  | No work at this time   |
| 41SN46   | Dam Site 19 | Diffuse lithic scatter;<br>no features                      | Large, deflated;<br>low potential  | No work at this time   |
| 41SN47   | Dam Site 19 | One feature   | Small, deflated;<br>low potential  | No work at this time   |

Table 31, continued

| Site No. | Location    | Description                                     | Assessment                                   | Recommendations                    |
|----------|-------------|---|--|------------------------------------|
| 41SN48   | Dam Site 19 | Diffuse lithic scatter;<br>one feature          | Moderate size,<br>deflated; low<br>potential | No work at this time               |
| 41SN49   | Dam Site 19 | Diffuse lithic scatter;<br>one feature          | Small, deflated;<br>low potential            | No work at this time               |
| 41SN50   | Dam Site 19 | Diffuse lithic scatter;<br>features             | Large, deflated;<br>low potential            | No work at this time               |
| 41SN51   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated<br>low potential             | No work at this time               |
| 41SN52   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Large, deflated;<br>low potential            | No work at this time               |
| 41SN53   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential            | No work at this time               |
| 41SN54   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Large, deflated;<br>low potential            | No work at this time               |
| 41SN55   | Dam Site 10 | Moderately dense lithic<br>scatter; no features | Large, deflated;<br>limited potential        | Uncontrolled surface<br>collection |
| 41SN56   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Large, deflated;<br>low potential            | No work at this time               |
| 41SN57   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential            | No work at this time               |
| 41SN58   | Dam Site 10 | Diffuse lithic scatter;<br>no features          | Small, deflated;<br>low potential            | No work at this time               |

Table 31, continued

| Site No. | Location                                    | Description                            | Assessment                                   | Recommendations      |
|----------|---|--|--|----------------------|
| 41SN59   | Dam Site 10                                 | Diffuse lithic scatter;<br>no features | Moderate size,<br>deflated; low<br>potential | No work at this time |
| 41SN60   | Dam Site 10                                 | Diffuse lithic scatter;<br>no features | Moderate size,<br>deflated; low<br>potential | No work at this time |
| 41SN61   | Dam Site 10                                 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential            | No work at this time |
| 41SN62   | Dam Site 10                                 | Diffuse lithic scatter;<br>no features | Small, disturbed;<br>low potential           | No work at this time |
| 41SN63   | Dam Site 10                                 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential            | No work at this time |
| 41SN64   | Dam Site 14                                 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential            | No work at this time |
| 41SN65   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>no features | Large, deflated;<br>low potential            | No work at this time |
| 41SN66   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential            | No work at this time |
| 41SN67   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>no features | Moderate size,<br>deflated; low<br>potential | No work at this time |

Table 31, continued

| Site No. | Location                                    | Description                            | Assessment                        | Recommendations      |
|----------|---|--|-----------------------------------|----------------------|
| 41SN68   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>one feature | Large, deflated;<br>low potential | No work at this time |
| 41SN69   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential | No work at this time |
| 41SN70   | Pipeline,<br>between Dam<br>Sites 14 and 19 | Diffuse lithic scatter;<br>no features | Small, deflated;<br>low potential | No work at this time |

APPENDIX II: Locality Descriptions

J. Peter Thurmond

## INTRODUCTION

The text which follows provides detailed locational and descriptive information for the 72 localities recorded during the present study in Kent, King and Stonewall counties, Texas. The term locality as used here is a deliberately flexible construct. Any spatially discrete phenomena which were deemed relevant to an archeological interpretation of the area, but which could not appropriately be recorded as archeological sites, were recorded as localities. The localities recorded include: (1) 34 exposures of stream-rolled gravels suitable for aboriginal use as hearthstones, boiling stones, and raw material in chipped or ground stone tool manufacture; (2) 18 springs; (3) 7 geologically informative fluvial terrace profiles; (4) 5 possible erosional remnants of aboriginal archeological sites; (5) 4 outcrops of copper sulphate; (6) 3 collapsed rockshelters; and (7) 1 concentration of dolomite slabs. A discussion of the localities is included in the main body of the report, and their locations are illustrated in Figures 9 through 11.

This appendix provides the following information for each locality: (1) the Texas Archeological Research Laboratory (TARL) trinomial designation; (2) the location within the project subdivisions (dam site or pipeline); (3) the designation of the survey unit which incorporates the locality; (4) the name and date of publication of the U.S. Geological Survey (USGS) 1:24 000-scale topographic quadrangle on which the locality is plotted; (5) elevation above Mean Sea Level (MSL) in feet and meters; (6) dimensions in meters; and (7) a description.

With this study TARL has initiated the assignment and coordination of a system of trinomial number designations separate from that used for archeological sites. Locality numbers are preceded by an upper case "L" to differentiate them from site numbers. Locality and site trinomial numbers are assigned in independent sequence; thus, there are both a site 41KT9 and a locality L41KT9.

In the succeeding sections of this appendix, a summary description of the stream-rolled gravels so ubiquitous through the study area is first provided to avoid the necessity of repetition in each of the 34 relevant locality descriptions. The information pertaining to each locality is then presented in alphanumerical order by county, beginning with Kent County.

## STREAM-ROLLED GRAVELS

Dense concentrations of well-rounded gravels are common within the study area, and they occur primarily in two geomorphological contexts: (1) in broad lag concentrations oriented parallel to and 12 to 24 meters above the level of the modern streams; and (2) eroding from the bases of more intact alluvial terraces at lower elevations, generally 6 to 9 meters above the modern streams. Despite the considerable size of the study area, which extends some 60 kilometers east-west and 30 kilometers

## APPENDIX II: LOCALITY DESCRIPTIONS

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north-south, the variations in the material composition and size of the gravels from one exposure to the next are surprisingly minor. For this reason, a single description of the gravels is presented here, and the succeeding locality descriptions will merely note any specific deviations from the general pattern.

By far the most common mineralogical component of the gravels is a diverse suite of red, brown, violet and gray colored, medium- to coarse-grained orthoquartzites and metaquartzites. A very fine-textured white or "milky" quartz is also common. Together, the coarser quartzites and milky quartz typically account for 75 percent of the gravels. Present in lesser, but significant, frequencies are various fine-grained quartzites. The most common varieties are dark violet, nearly vitreous metaquartzites and gray to brown siliceous siltstones. The latter is often referred to as "Potter chert" or "Ogallala quartzite" (Patton 1923; Etchieson et al. 1977:12-13). The present study uses the latter term to refer to this material. A number of other materials are present as minor constituents: gray to tan cherts; red, brown and yellow monocolored jaspers; mottled red, brown, yellow and violet jaspers, often referred to as "Tecovas jasper" (c.f., Hughes and Willey 1978:20-23); various multicolored silicified woods; indurated sandstones; and various volcanic rocks, especially andesite and rhyolite.

All of the above-described materials appear to derive from well-known sources along the eastern edge of the Llano Estacado. These sources primarily are the Potter Gravels of the Pliocene Ogallala Formation and the siliceous lentils and conglomerates of the Triassic Dockum Group (c.f., Hood 1978; Holliday and Welty 1981). The probable origins and patterns of aboriginal exploitation of these materials are discussed in Appendix V.

Locally common in the gravel deposits are various precipitates and clastics which derive from the Permian units which outcrop within the study area. Poorly to well-rounded fragments of dolomite, selenite, halite, shale and poorly consolidated sandstone were observed downstream from known outcrop areas. For example, selenite is quite common in the gravels of the Dam Site 14 area, and dolomite is most common at Dam Site 19. Most of the drainage basin above Dam Site 14 is in an outcrop zone of the Whitehorse Group which contains a greater frequency of selenite beds than any other in the area. The upper end of the Dam Site 19 basin is dominated by outcrops of Blaine Formation dolomite.

Regardless of origin, generally 75 to 80 percent of the gravels are relatively small pebbles less than 5 centimeters in diameter. The remaining 20 to 25 percent is composed of cobbles which typically range from 6 to 10 centimeters in diameter. Only rarely are more than 5 percent of the gravels larger than 10 centimeters in diameter, but specimens up to 30 centimeters in diameter occur.

Certain materials are more common than others within these size classes. The largest cobbles, ranging from 10 to 30 centimeters in diameter, are usually Ogallala quartzite. Coarse-grained quartzites and, to a lesser extent, silicified wood dominate the 5-to-10-centimeter



range. All other materials tend to be smaller than 5 centimeters in diameter.

## KENT COUNTY LOCALITIES

L41KT1 (Dam Site 10, Survey Unit A-10)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1785 feet/544 meters

Dimensions: 3 meters E-W by 2 meters N-S

Description: Several modern Bos bones were observed in the cutbank of an arroyo which dissects the second fill terrace above Croton Creek approximately 4 kilometers upstream of its confluence with Short Croton Creek. The terrace surface is approximately 8 meters above the present Croton Creek channel, and the faunal material lies 1.5 meters below that surface. There is no visible mineral replacement in the bones. No soil horization has occurred in the alluvium, and fluvial stratification is well preserved throughout the profile. This locality demonstrates the recent origin of the terrace.

L41KT2 (Dam Site 10, Survey Unit A-24)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1770 feet/540 meters

Dimensions: 125 meters NW-SE by 30 meters NE-SW

Description: Stream-rolled gravels are eroding from the base of a fill terrace immediately adjacent to and approximately 6 meters above the present channel of Croton Creek approximately 800 meters upstream of its confluence with Short Croton Creek. The terrace appears to be of quite recent origin; no soil horization is visible in the approximately 1.5 meters of fine sandy loam terrace fill which overlies the gravels, and few of the stones exhibit carbonate rinds. See also L41KT8.

L41KT3 (Dam Site 10, Outside Survey Area)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1920 feet/585 meters

Dimensions: 40 meters NE-SW by 1 meters NW-SE

Description: A thin bed of stream-rolled gravels has been exposed by a roadcut in the uplands 1.7 kilometers southwest of and 46 meters

## APPENDIX II: LOCALITY DESCRIPTIONS

above the present Short Croton Creek channel. The gravel bed is 15 to 20 centimeters in thickness and lies 1 meter below the surface. The stones are quite large; they average 10 to 15 centimeters in diameter. A stream channel deposit is presumably represented. A reddish, very fine sandy loam exhibiting a well-developed argillic horizon overlies the gravels. The occurrence of an alluvial terrace remnant so high in the uplands is surprising.

### L41KT4 (Dam Site 10, Survey Units A-16, A-17, A-19)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1785-1810 feet/544-552 meters

Dimensions: 800+ meters NW-SE by 125 meters NE-SW

Description: A moderately dense lag concentration of stream-rolled gravels lies along the western margin of the Croton Creek valley approximately 1.5 kilometers upstream of its confluence with Short Croton Creek. The gravel bed is terminated on its upstream (northwestern) end in Survey Unit A-16 by a deep gully, but its downstream (southeastern) extent has not been determined. The gravels lie on an upland slope and rest directly on Whitehorse Group sandstone 6 to 15 meters above the present stream channel. Most of the stones exhibit carbonate rinds. No cultural material was noted in association with the gravels.

### L41KT5 (Dam Site 10, Survey Unit B-26)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1785-1810 feet/544-552 meters

Dimensions: 500 meters N-S by 70 meters E-W

Description: A dense lag concentration of stream-rolled gravels is exposed along the western margin of Panther Canyon approximately 500 meters upstream of its confluence with Croton Creek. The valley of Croton Creek terminates the gravel bed on its northern end, and a deep gully forms its southern boundary. The gravels are scattered down an upland slope, along the valley margin, resting directly on Permian bedrock of the Whitehorse Group 6 to 8 meters above the present channel of Panther Creek and 12 to 16 meters above Croton Creek. Most of the stones exhibit carbonate rinds. Two concentrations of aboriginal occupational debris within the locality were recorded as 41KT18 and 41KT19, and 41KT11 lies only 50 meters beyond the northern end of the gravel. Isolated debitage specimens were noted at a very low density throughout the gravel exposure. The material composition of the gravels is as summarized in the introduction, but many of the specimens are exceptionally large, ranging up to 25 to 30 centimeters in diameter.

L41KT6 (Dam Site 10, Survey Unit A-32)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1800-1810 feet/549-552 meters

Dimensions: 300 meters N-S by 40 meters E-W

Description: A moderately dense exposure of stream-rolled gravels occurs along the eastern margin of a very short right-bank tributary of Croton Creek less than 500 meters downstream of its confluence with Panther Creek. The gravels appear to be eroding from the base of an early Holocene or Pleistocene terrace of Croton Creek 15 to 18 meters above the present channel. Where exposed, the gravels rest directly on bedrock of the Whitehorse Group, but it is likely that the materials continue on to the east below the surface and are capped by a mantle of alluvium 3 to 5 meters in depth. A profile suitable for an examination of the alluvium for the presence of soil horizonation was not available, but most of the exposed gravels exhibit carbonate rinds. Isolated debitage specimens were found intermixed with the gravels. The material composition of the gravels is as summarized in the introduction, but, as at the nearby L41KT5, many of the specimens are exceptionally large, ranging up to 25 to 30 centimeters in diameter.

L41KT7 (Dam Site 10, Survey Unit B-25)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1820 feet/555 meters

Dimensions: 130 meters N-S; E-W extent unknown

Description: A fill terrace deposit approximately 500 meters east and 18 meters above the present Croton Creek channel near its confluence with Short Croton Creek has been exposed in a recent roadcut. Two immediately adjacent channel deposits of gravel are visible in cross section at the base of the cut. Each bed is approximately 10 meters wide, 30 to 40 centimeters in maximum thickness, and tapers at either end. The gravel beds rest directly on sandstone of the Whitehorse Group. A thin mantle of red sandy alluvium, no more than 50 centimeters in depth, overlies the gravels. An Inceptisol with cambic B and calcic horizons has formed in this alluvium. Carbonate rinds occur on most of the gravels. No cultural material is visible in the exposure or on the surrounding slopes. See also L41KT9.

L41KT8 (Dam Site 10, Survey Unit A-26)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1870-1885 feet/570-575 meters

## APPENDIX II: LOCALITY DESCRIPTIONS

Dimensions: 430 meters E-W by 60 meters N-S

Description: Stream-rolled gravels are eroding from the base of a shallow alluvial terrace and are forming a moderately dense lag concentration along a broad gentle slope on the left bank of Short Croton Creek 400 to 830 meters upstream from its confluence with Croton Creek. The terrace from which the gravels are eroding is quite broad, covers approximately one-half square kilometer, and its surface lies 9 meters above the present Croton Creek and Short Croton Creek channels. Given its position at the confluence, the terrace could relate to either stream or to both. L41KT2 and L41KT8 are both exposures of the basal gravels of this terrace along its northern and southern scarps respectively. No cultural material was observed in association with the gravels at either locality. There is no visible soil horizonation in the approximately 1.5 meters of fine sandy loam terrace fill which overlies the gravels, and none of the gravels exhibit carbonate rinds. It therefore seems likely that the terrace is of quite recent origin.

L41KT9 (Dam Site 10, Survey Units A-33, B-27)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780-1820 feet/543-555 meters

Dimensions: 700+ meters E-W by 720 meters N-S

Description: An extensive, dense lag concentration of stream-rolled gravels occurs in a heavily dissected area on the northern side of Croton Creek approximately 1 kilometer downstream from its confluence with Short Croton Creek and approximately 500 meters east of L41KT7. The eastern and western termini of the gravel exposure were not determined by the survey. The gravels are eroding from the base of the same shallow alluvial terrace exposed at that locality. As at L41KT7, the in situ gravels are at the base of the terrace at an elevation 18 meters above that of the present Croton Creek channel, and rest directly on bedrock of Whitehorse Group sandstone; the gravels are overlain by 50 to 75 centimeters of red sandy alluvium. An Inceptisol with cambic B and calcic horizons has formed in the overlying alluvial mantle, and most of the gravels exhibit carbonate rinds. The material has washed downslope approximately 12 meters vertically and 100 to 200 meters horizontally. Isolated lithic debitage specimens were found scattered throughout the exposure at a very low density. Two concentrations of aboriginal occupational debris within the locality were recorded as sites 41KT26 and 41SN63. As at L41KT5 and L41KT6 on the opposite side of Croton Creek, many of the gravels are exceptionally large and range up to 20 to 25 centimeters in diameter.

## KING COUNTY LOCALITIES

L41KG1 (Dam Site 19, Survey Unit A-167)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1540-1550 feet/469-472 meters

Dimensions: 30 meters N-S by 12 meters E-W

Description: The basal dolomitic conglomerate of the San Angelo Formation forms a caprock approximately 1 meter thick along the rim of a short tributary canyon on the northern side of North Croton Creek 1.5 kilometers upstream from its confluence with Wedington Creek. The resistance to erosion of this indurated conglomerate has facilitated the formation of a deep, narrow, steep-sided canyon below its outcrop. At one bend of the tributary the conglomerate caprock has been undercut and has subsequently collapsed. It seems likely that a rockshelter was present during the phase of undercutting and prior to the collapse of the conglomerate. It is not possible to determine whether any cultural deposits underlie the roof fall on the basis of present surface indications.

L41KG2 (Dam Site 19, Survey Unit A-191)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1505 feet/459 meters

Dimensions: 5 meters N-S by 1 meter E-W

Description: Numerous bone fragments, some partially mineralized, are eroding from a small fill terrace on the eastern bank of Bradley Creek roughly 1.5 kilometers upstream from its confluence with North Croton Creek. The surface of the terrace is approximately 2.5 meters above the present channel of Bradley Creek, and the bone fragments are originating 80 to 125 centimeters below the terrace tread. None of the faunal material is identifiable other than as large mammal. No cultural material was observed. The terrace appears to be of quite recent origin; there is no visible development of soil horizons in the alluvium, and fluvial stratification is well preserved throughout the profile. The faunal material could easily date to the Historic Period.

L41KG3 (Dam Site 19, Survey Unit B-139)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1585 feet/483 meters

## APPENDIX II: LOCALITY DESCRIPTIONS

Dimensions: 6 meters N-S by 1.5 meters E-W

Description: A small outcrop of copper sulphate occurs on a slope overlooking Bradley Creek 3.5 kilometers upstream of its confluence with North Croton Creek. The outcrop appears in a short, thin lens of greenish gray marl directly overlying a bed of gypsum. The copper sulphate is ubiquitous through the marl and has percolated down to form a thin precipitate rind atop the selenite bed.

### L41KG4 (Dam Site 19, Survey Unit B-138)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1610 feet/491 meters

Dimensions: Each less than 1 meter in diameter

Description: Two springs, roughly 30 meters apart, were noted on the western side of Bradley Creek 4 kilometers upstream from its confluence with North Croton Creek. The springs are approximately 300 meters west and 15 meters above the elevation of the Bradley Creek channel. Both discharge into Bradley Creek and were flowing quite freely on June 10, 1981. The water appears to flow from the underside of a selenite bed and is rather gypsiferous. There appear to be many springs in the uplands about the headwaters of Bradley Creek which are outside the units surveyed in that area (B-138, B-141). The stream was flowing throughout its course at the time of the survey. A dense growth of hackberry, wild plum, mesquite and juniper follows the courses of Bradley Creek and many of its tributaries in this area.

### L41KG5 (Dam Site 19, Survey Unit A-117)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1550-1570 feet/472-479 meters

Dimensions: 550+ meters N-S by 100 meters E-W

Description: A dense lag concentration of stream-rolled gravels is on the left bank valley margin slope of North Croton Creek 1 kilometer upstream of its confluence with Pen Branch. The gravel exposure extends beyond the bounds of the relevant survey unit, and its northern and southern extremities were therefore not determined. The gravels are scattered down the slope at elevations 12 to 18 meters above the level of the present North Croton Creek channel and rest directly on interbedded clays and dolomite of the Blaine Formation. Most of the stones exhibit carbonate rinds. Isolated lithic debitage specimens were found scattered through the gravels at a very low density.

L41KG6 (Dam Site 19, Survey Unit A-117)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1595 feet/486 meters

Dimensions: Each less than 1 meter in diameter

Description: Two springs, approximately 5 meters apart, were found to be flowing on June 9, 1981 near the head of a very short left-bank tributary of North Croton Creek 200 meters east of its channel and 1.5 kilometers upstream of its confluence with Pen Branch. The total length of this tributary is less than 500 meters, and its basin covers less than one-quarter square kilometer. Water was flowing at a very slow rate from the upper contact of a dolomite bed and was relatively fresh to the taste. A dense growth of juniper, hackberry and tall grasses occupies the floor of the tributary canyon below the springs.

L41KG7 (Dam Site 19, Survey Unit A-132)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1520-1550 feet/463-472 meters

Dimensions: 500+ meters E-W by 170 meters N-S

Description: A dense lag concentration of stream-rolled gravels lies on the left-bank valley slope of North Croton Creek 12 to 21 meters above the elevation of its present channel and approximately 2 kilometers downstream of its confluence with Pen Branch. The gravel exposure extends beyond the bounds of the relevant survey unit, and its eastern and western termini were therefore not determined. The gravels rest directly atop a dolomite bed of the Blaine Formation, which forms a bed-rock bench, and are washing downslope. In places the gravels atop the dolomite are still cemented together in a caliche matrix. Most of the specimens exhibit carbonate rinds. Isolated lithic debitage specimens are scattered among the gravels at a very low density.

L41KG8 (Dam Site 14, Survey Unit B-59)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1690 feet/515 meters

Dimensions: Less than 1 meter in diameter

Description: The discharge point of a salt spring that flows from an opening approximately 1 meter above the salt flat which forms the floor of Haystack Canyon. Brine was flowing quite freely at the western valley margin from a gypsum bed of the Blaine Formation on June 17, 1981. No vegetation grows below the spring. It appears that fresher

## APPENDIX II: LOCALITY DESCRIPTIONS

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springs may once have flowed from the slope above; a steep draw runs upslope from the spring and its floor is densely vegetated.

### L41KG9 (Dam Site 14, Survey Units A-61, A-62)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1710-1760 feet/521-536 meters

Dimensions: 625 meters NW-SE by 200 meters NE-SW

Description: A dense lag concentration of stream-rolled gravels occurs on the northern valley slope above Dove Creek 1.5 to 2 kilometers upstream of its confluence with Salt Flat Creek. The gravels appear to have originated at least 16 to 18 meters above the present Dove Creek channel and have washed downslope to a point approximately 6 meters above the creek. The material now rests directly on shale of the Blaine Formation and is just below the contact with the overlying Whitehorse Group. Any finer-textured alluvium which may have been deposited with the gravels has been eroded. Most of the stones exhibit carbonate rinds. No cultural material was observed within the locality.

### L41KG10 (Dam Site 19, Survey Unit B-113)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1605 feet/489 meters

Dimensions: 30 meters E-W by 25 meters N-S

Description: A small, moderately dense concentration of fractured quartzite cobbles rests on a bedrock bench approximately 500 meters north and 26 meters above Pen Branch 2 kilometers upstream of its confluence with North Croton Creek. The material is in a position roughly intermediate between the uplands to the north of Pen Branch and its floodplain. Bulldozer clearing of brush has severely disturbed the surface of the entire area, and most of the quartzite fragments were found in spoil piles. Given the absence of any definite cultural material, and reasoning that tracked-machine equipment could account for the fracturing of the quartzite cobbles, the survey crew chose not to record this concentration as a site. In retrospect, however, it seems likely that only human activity could account for the presence of the quartzite in this location, and the material is probably burned rock. There are no known natural quartzite deposits along Pen Branch, a relatively short tributary of North Croton Creek, and it seems likely that the material was carried up from the valley of the latter stream. If L41KG10 is an aboriginal site, it has been severely disturbed. There is not adequate information on record for the proper recording of the concentration as a site, and so its designation will not be changed at this time. However, if a later survey should pass through the vicinity, it is suggested that L41KG10 be revisited and reassessed. See also L41KG11 and L41KG13.



L41KG11 (Dam Site 19, Survey Unit A-119)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1585 feet/483 meters

Dimensions: 50 meters NE-SW by 20 meters NW-SE

Description: The assessment of L41KG10 in the preceding locality description can be extended to L41KG11. A diffuse scatter of fractured quartzite cobbles and lithic debitage was observed eroding from piles of juniper and soil created by recent brush-clearing operations. The material was found in a topographic position quite similar to that of L41KG10 on a bedrock bench intermediate between the uplands and the floodplain at the confluence of Pen Branch and North Croton Creek. The position of L41KG11 at the margin of the North Croton Creek valley renders more plausible a natural origin for the quartzite gravels, but the substantial presence of lithic debitage suggests otherwise. It seems likely that L41KG11 should also have been recorded as a site, but there is not adequate documentation to do so now. Whatever the case, the research potential of the deposit has been virtually destroyed by brush clearing.

L41KG12 (Dam Site 19, Survey Unit A-120)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1530-1550 feet/466-472 meters

Dimensions: 150 meters N-S by 80 meters E-W

Description: A dense lag concentration of stream-rolled gravels rests on a bedrock bench at the confluence of Pen Branch and North Croton Creek 9 to 15 meters above their present channels. The gravels now rest directly on sandstone of the Blaine Formation, and any finer-textured alluvium which may have been deposited with the gravels has been eroded. Most of the stones exhibit carbonate rinds. No cultural material was observed in association with the gravels.

L41KG13 (Dam Site 19, Survey Unit B-124)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1605 feet/489 meters

Dimensions: 2 meters N-S by 3 meters E-W

Description: Analogous to L41KG10 and L41KG11 in that the locality might have been more properly recorded as a site. Several fragments of quartzite and chert were observed eroding from the soil remnant about the roots of a juniper tree located on a severely deflated bedrock bench

## APPENDIX II: LOCALITY DESCRIPTIONS

intermediate between the floodplain of North Croton Creek and the uplands to the south. The locality is approximately 38 meters above the elevation of the present North Croton Creek channel roughly 2 kilometers downstream of its confluence with Pen Branch. It seems likely that the remnant of a site which has been virtually destroyed by erosion is represented.

### L41KG14 (Dam Site 14, Outside Survey Area)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1720-1780 feet/524-543 meters

Dimensions: 500 meters NE-SW by 300 meters NW-SE

Description: An excellent series of geological profiles is exposed along the middle reaches of Southerland Canyon approximately 3 kilometers upstream from the confluence of Southerland and Salt Croton creeks. Clearly visible in a series of vertical profiles up to 20 meters in height are various episodes of bedrock benching, channel excision and fill, and overlapping alluvial deposition. Numerous fill terrace deposits overlie the bedrock at different elevations. Very thinly bedded red and gray shales and sandstones of the Blaine Formation underlie the terraces, and a gypsum bed forms the present floor of the canyon. The only gravels observed in the terrace profiles are slightly worn fragments of the same shale and gypsum. Even the lowest terrace, the surface of which is approximately 6 meters above the present channel, exhibits the formation of argillic and calcic horizons; this indicates that all of the terraces within the locality are of early Holocene or greater age.

### L41KG15 (Dam Site 19, Survey Unit B-69)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1570-1610 feet/479-491 meters

Dimensions: 420 meters E-W by 165 meters N-S

Description: A large dense lag concentration of stream-rolled gravels occurs on the left bank of North Croton Creek approximately 8.5 kilometers upstream of its confluence with Pen Branch. The gravels are distributed across the surface of a bedrock bench approximately 12 meters above the elevation of the present channel and have washed down the slope below to a point approximately 4 meters above the channel. Dolomites and clays of the Blaine Formation directly underlie the gravels throughout the locality, and any finer-textured alluvium which may have been deposited with the gravels has been entirely removed by erosion. Most of the stones exhibit carbonate rinds. A few isolated debitage specimens were observed.

L41KG16 (Dam Site 19, Survey Unit A-94)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1580-1590 feet/482-485 meters

Dimensions: 190 meters E-W by 45 meters N-S

Description: A relatively small but dense lag concentration of stream-rolled gravels is exposed on a bedrock bench above the right bank of North Croton Creek approximately 9 kilometers upstream from its confluence with Pen Branch. The surface of the bench is roughly 12 meters above the present North Croton Creek channel. A nearly vertical slope separates the bench surface from the creek, and there has therefore been very little accumulation of the gravels downslope. The material rests directly on a Blaine Formation dolomite bed. Any finer-textured alluvium which may have been deposited with the gravel has been entirely removed by erosion. Most of the stones exhibit carbonate rinds. No cultural material was observed in association with the gravels.

L41KG17 (Dam Site 19, Survey Unit A-103)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1560-1580 feet/475-482 meters

Dimensions: 230 meters E-W by 90 meters N-S

Description: A dense lag concentration of stream-rolled gravels rests on a bedrock bench and surrounding slopes above the left bank of North Croton Creek roughly 5.5 kilometers upstream of its confluence with Pen Branch. The surface of the bench is approximately 12 meters above the present North Croton Creek channel, and gravel has washed downslope to a point approximately 6 meters above the streambed. Blaine Formation shale directly underlies the gravel, and any finer-textured alluvial deposits which may once have been present have been removed by erosion. Most of the stones exhibit carbonate rinds. Isolated lithic debitage and burned rock fragments are intermixed with the gravel at a very low density.

L41KG18 (Dam Site 19, Survey Unit A-103)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1570-1580 feet/479-482 meters

Dimensions: 125 meters N-S by 80 meters E-W

Description: A dense lag concentration of stream-rolled gravels situated on a bedrock bench and the slope below it overlooks the right bank of North Croton Creek approximately 5.5 kilometers upstream of its

## APPENDIX II: LOCALITY DESCRIPTIONS

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confluence with Pen Branch. The locality is less than 100 meters south-east of L41KG17, and the bench on which the main body of the gravel bed rests is at the same elevation as that associated with L41KG17: 12 meters above the present North Croton Creek channel. Gravels have washed downslope to a point roughly 9 meters above the modern streambed. The gravels rest directly on Blaine Formation shale, and any finer-textured alluvium which was originally present has been stripped away by erosion. Most of the stones exhibit carbonate rinds. A few isolated specimens of lithic debitage were noted by the survey crew.

### L41KG19 (Dam Site 19, Survey Unit A-104)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1570-1580 feet/479-482 meters

Dimensions: 200 meters N-S by 50 meters E-W

Description: A dense lag concentration of stream-rolled gravels is situated above the left bank of North Croton Creek approximately 5 kilometers upstream of its confluence with Pen Branch and 500 meters downstream of analogous deposits at L41KG17 and L41KG18. The gravels rest directly on a gently sloping outcrop of Blaine Formation shale at the base of the steep eastern valley margin scarp from the uplands and are roughly 12 meters above the present North Croton Creek channel. The deposit is thus at the same elevation above the modern stream as all of its upstream neighbors, L41KG15 through L41KG18. Most of the stones exhibit carbonate rinds. The survey crew observed scattered lithic debitage intermixed with the gravels.

### L41KG20 (Dam Site 19, Survey Unit A-132)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1490-1505 feet/454-459 meters

Dimensions: 360 meters NW-SE by 75 meters NE-SW

Description: The present channel of North Croton Creek has incised downward roughly 6 meters through the broad expanses of valley fill which parallel its lower reaches and has exposed nearly vertical profiles. Alluvial stratification is clearly visible throughout the vertical extent of the profiles, and there is no evidence of soil formation. The alluvium is predominantly reddish brown silt and fine sand. A nearby resident of 40 years, Bandy Bradley of Long Ranch, informed the survey crew that these terraces flood every decade or so, gaining approximately 1 to 2 centimeters of sediment each time. The profiles exposed at L41KG20 and at a similar locality downstream, L41SN32, certainly indicate that these low terraces are actively aggrading and are of quite recent origin. One would not expect to find aboriginal sites on the surfaces of such landforms.

STONEWALL COUNTY LOCALITIES

L41KG21 (Dam Site 19, Survey Unit A-130)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1530-1550 feet/466-472 meters

Dimensions: 400+ meters NW-SE by 100 meters NE-SW

Description: A dense lag concentration of stream-rolled gravels on the valley margin slope parallels the left bank of North Croton Creek 1.5 kilometers downstream from its confluence with Pen Branch. The gravel exposure extends beyond the bounds of the relevant survey unit, and its northwestern and southeastern termini were therefore not determined. The gravels follow the crest of the slope 15 meters above the level of the present stream and have washed downslope to a point approximately 9 meters above the streambed. Shale and dolomite of the Blaine Formation directly underlie the gravels, and any finer-textured alluvium which may have once accompanied the gravels has been removed by erosion. In places the gravels are cemented together in a caliche matrix, and most of the specimens exhibit carbonate rinds. Isolated specimens of lithic debitage were observed scattered among the gravels at a very low density.

STONEWALL COUNTY LOCALITIES

L41SN1 (Dam Site 19, Survey Unit A-192)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1490-1500 feet/454-457 meters

Dimensions: 20 meters N-S by 5 meters E-W

Description: A collapsed rockshelter is situated above the left bank of Bradley Creek 1.3 kilometers upstream of its confluence with North Croton Creek. A relatively resistant sandstone bed underlain by softer shale has been exposed by the downcutting of Bradley Creek. Lateral migration of the streambed has undercut the sandstone bed at this locality, and the roof of the resultant shelter appears to have collapsed quite recently. A space approximately 20 meters long, 5 meters wide and 2 meters high must have existed beneath the roof prior to its collapse. However, the floor is only 1.2 meters above the present level of the stream and appears to have been frequently scoured by floodwaters prior to the collapse of the roof. If any cultural deposits ever existed within the shelter, they have certainly been removed by erosion.

L41SN2 (Dam Site 19, Survey Unit A-169)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

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Elevation: 1490-1500 feet/454-463 meters

Dimensions: 500+ meters NW-SE by 100 meters NE-SW

Description: A dense lag concentration of stream-rolled gravels is on the left-bank valley margin slope of North Croton Creek immediately opposite its confluence with Wedington Creek. The gravels follow the crest of the slope parallel to the longitudinal axis of the valley at an elevation roughly 15 meters above the level of the present streambed and have washed downslope to a point approximately 9 meters above the channel elevation. The gravel exposure extends beyond the boundaries of the survey unit to the northwest and the southeast, and its limits are therefore undefined. In places the gravels are imbedded in a caliche matrix, and most of the stones exhibit carbonate rinds. Isolated specimens of lithic debitage were observed in association with the gravels at a very low density.

### L41SN3 (Dam Site 19, Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1530 feet/466 meters

Dimensions: 5 meters E-W by 2 meters N-S

Description: A small outcrop of copper sulphate at the base of a ridge which projects into the Wedington Creek floodplain is located roughly 1 kilometer upstream from the confluence of that stream with North Croton Creek. The mineral is in a soft clay matrix and is directly underlain by a gypsum bed.

### L41SN4 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: The discharge point of a small gypsiferous spring emerges from the upper edge of a gypsum bed of the Blaine Formation. The spring was flowing at a very slow rate on June 8, 1981 from a point 100 meters downstream and 15 meters below the head of a small, north-flowing canyon which dissects the upland slope overlooking the left bank of Wedington Creek roughly 1 kilometer upstream of its confluence with North Croton Creek. Below the spring, the floor of the canyon is covered by a relatively dense growth of juniper, tall grasses and forbs. Small bedrock pools occur along its course. The water is quite salty to the taste. No cultural material was observed in the vicinity.

STONEWALL COUNTY LOCALITIES

L41SN5 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: A small gypsiferous spring flows from the same gypsum bed and discharges from the east wall of the same small canyon as L41SN4 and is roughly 50 meters to the northeast of that locality. The spring was flowing very slowly on June 8, 1981.

L41SN6 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: A third small gypsiferous spring, approximately 100 meters northwest of L41SN4, flows at the same elevation and from the top of the same gypsum bed as L41SN4 and L41SN5. The spring was flowing very slowly on June 8, 1981. Its effluent drains down a small, north-flowing canyon with a very steep gradient to the immediate west of that associated with L41SN4 and L41SN5. The floor of the canyon below the spring exhibits a dense growth of juniper, acacia, grasses and forbs. No cultural material was observed in the vicinity.

L41SN7 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: A fourth small gypsiferous spring, roughly 100 meters northwest of L41SN6 and 200 meters northwest of L41SN4, discharges at the same elevation and from the same aquifer. The spring was flowing very slowly on June 8, 1981. A third small, north-flowing canyon with a very steep gradient, to the immediate west of that associated with L41SN6, receives the effluent of L41SN7. Two additional springs, L41SN8 and L41SN9, were identified at the same elevation as L41SN7 at points farther to the south along the eastern canyon wall. The floor of the canyon below the springs is densely overgrown by juniper, acacia, thistles, grasses and various forbs. No cultural material was observed in the vicinity.

## APPENDIX II: LOCALITY DESCRIPTIONS

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### L41SN8 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: A small gypsiferous spring on the same small canyon as L41SN7, approximately 30 meters to the south, discharges at the same elevation and from the same aquifer. The spring was flowing very slowly on June 8, 1981. See the description of L41SN7.

### L41SN9 (Dam Site 19, South of Survey Unit B-188)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1590 feet/485 meters

Dimensions: Less than 1x1 meter

Description: A small gypsiferous spring, approximately 35 meters to the south of L41SN8 and 65 meters south of L41SN7, discharges from the eastern wall of the same small, north-flowing canyon, at the same elevation and from the same aquifer. The spring was flowing very slowly on June 8, 1981. Given the steep gradient of the canyon floor, the three springs recorded as L41SN7 through L41SN9 are progressively higher up the canyon wall as one proceeds downstream. Thus, while L41SN9 is only approximately 1 meter above the canyon floor, L41SN7 discharges some 14 meters above the floor.

### L41SN10 (Dam Site 19, Survey Unit A-157)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1530 feet/466 meters

Dimensions: 10 meters NE-SW by 2 meters NW-SE

Description: A small outcrop of copper sulphate on a bedrock bench overlooks the confluence of North Croton and Wedington creeks from the west. The mineral has crystallized on the upper surface of a gypsum bed which is overlain by a bed of poorly consolidated sandstone. Both beds are members of the Blaine Formation.

### L41SN11 (Dam Site 19, Survey Unit A-196)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1520 feet/463 meters



Dimensions: 20 meters N-S by 20 meters E-W

Description: Five quartzite cobbles and three quartzite cobble fragments were found scattered over an area approximately 20 meters in diameter. The locality is at the crest and streamward end of a severely eroded upland ridge which projects into the North Croton Creek floodplain from the south approximately 1.5 kilometers downstream of its confluence with Wedington Creek. None of the fracturing is obviously heat-induced, and there is no definite cultural material associated with the cobbles. However, given that the extensive lag gravel deposits noted along the lower reaches of North Croton Creek seem to be limited to its left (northern) bank, it seems likely that the quartzite has been introduced by human activity. The remnant of an aboriginal site largely destroyed by erosion may be represented.

L41SN12 (Dam Site 19, Survey Unit A-204)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1515 feet/462 meters

Dimensions: Unknown

Description: One quartzite cobble fragment and one possible flake of quartzite were found approximately 10 meters apart at the crest of a severely eroded upland ridge which projects into the floodplain of North Croton Creek from the south. L41SN12 is roughly 2.5 kilometers east of the confluence of North Croton and Wedington creeks, and overlooks the confluence of North Croton Creek and a small, nameless, right-bank tributary. As in the case of the nearby L41SN11, it is possible that the remnant of a site virtually destroyed by erosion is represented.

L41SN13 (Dam Site 19, Survey Unit B-203)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1600 feet/468 meters

Dimensions: Less than 1x1 meter

Description: A small gypsiferous spring is located near the head of a short west-flowing tributary canyon above the right bank of Smelter Creek approximately 2.5 kilometers upstream (south) of its confluence with North Croton Creek. The spring was observed to be flowing very slowly on June 8, 1981 from the upper contact of a Blaine Formation gypsum bed. This is probably an updip outcrop of the same bed associated with the springs at L41SN4 through L41SN9 which are 2.5 kilometers to the northwest. There is a heavy growth of juniper, grasses and forbs on the canyon floor below the spring. No cultural material was noted in the vicinity.

## APPENDIX II: LOCALITY DESCRIPTIONS

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### L41SN14 (Dam Site 19, Survey Unit B-203)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1600 feet/468 meters

Dimensions: Less than 1x1 meter

Description: A small gypsiferous spring approximately 125 meters to the south of L41SN13 is in a parallel-flowing tributary canyon. The spring was seen to be flowing very slowly on June 8, 1981; it is at the same elevation and from the same aquifer as L41SN13. As at that locality, the canyon floor below the spring is heavily overgrown with juniper, grasses and forbs. No cultural material was observed in the vicinity.

### L41SN15 (Dam Site 19, Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1555 feet/474 meters

Dimensions: 25 meters NW-SE by 3 meters NE-SW

Description: Three small springs in close association, each less than 10 meters from its neighbor, are in the northeast wall of a short northwest-flowing tributary canyon above the right bank of Wedington Creek approximately 1.5 kilometers upstream of its confluence with North Croton Creek. L41SN15 is at the center of a cluster of springs designated L41SN15 through L41SN18 which is approximately 500 meters southwest of the cluster designated L41SN4 through L41SN9. The three springs at L41SN15 were seen to be flowing very slowly from a sandstone bed of the Blaine Formation on June 9, 1981. Although the water is slightly salty to the taste, it is probable potable. There is another spring upstream of L41SN15, recorded as L41SN16, and the entire length of the canyon floor below the latter locality is densely overgrown with juniper, mesquite, featherplume, sumac and tall grasses. No cultural material was observed in the vicinity.

### L41SN16 (Dam Site 19, East of Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1600 feet/488 meters

Dimensions: Less than 1x1 meter

Description: A small spring was seen to be flowing at a very slow rate from a sandstone bed of the Blaine Formation on June 9, 1981. This spring is approximately 130 meters east of the three recorded as L41SN15 which are further up the same small canyon. The water issuing from

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L41SN16 is slightly salty to the taste but is probably potable. No cultural material was observed in the vicinity. See L41SN15.

L41SN17 (Dam Site 19, East of Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1600 feet/488 meters

Dimensions: Less than 1x1 meter

Description: Another small spring was seen to be flowing very slowly on June 9, 1981 at the same elevation and from the same aquifer as L41SN16; it is roughly 100 meters to the north of that locality near the head of an adjacent canyon. The water tasted slightly salty but is probably potable. A dense growth of juniper, mesquite, featherplume, sumac and various tall grasses follows the canyon floor below the spring. No cultural material was observed in the vicinity.

L41SN18 (Dam Site 19, Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1580 feet/482 meters

Dimensions: 15 meters E-W by 3 meters N-S

Description: Two small springs roughly 15 meters apart are in the northern wall of a west-flowing canyon which joins that containing L41SN17. The latter spring is approximately 100 meters to the northwest. The springs were seen to be flowing very slowly on June 9, 1981 from a sandstone bed of the Blaine Formation. The water is slightly salty to the taste but is probably potable. A dense growth of mesquite, juniper and tall grasses covers the canyon floor below the springs. No cultural material was observed in the vicinity.

L41SN19 (Dam Site 19, Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1530 feet/466 meters

Dimensions: 10 meters E-W by 5 meters N-S

Description: A small outcrop of copper sulphate occurs along the upper contact of a gypsum bed which is overlain by Permian sandstone. Both beds are members of the Blaine Formation. The outcrop is near the base of an upland ridge which projects into the floodplain of Wedington Creek above its right bank approximately 1.5 kilometers upstream from its confluence with North Croton Creek.

## APPENDIX II: LOCALITY DESCRIPTIONS

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### L41SN20 (Dam Site 19, Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1585 feet/483 meters

Dimensions: Less than 1x1 meter

Description: A small spring is at the head of a short canyon which is indirectly tributary to Wedington Creek and is approximately 500 meters due west of the spring cluster recorded as L41SN15 through L41SN18. The spring was observed to be flowing very slowly from a sandstone member of the Blaine Formation on June 9, 1981. The floor of the canyon is densely overgrown with juniper and tall grasses. Although the water is slightly salty to the taste, it is probably potable. No cultural material was observed in the vicinity.

### L41SN21 (Dam Site 19, Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1585 feet/483 meters

Dimensions: Less than 1x1 meter

Description: A small spring at the head of a short canyon, approximately 100 meters southeast of that associated with L41SN20, issues at the same elevation and from the same aquifer. Very slow discharge was observed on June 9, 1981, and the water is relatively fresh. A dense growth of juniper and tall grasses covers the canyon floor. No cultural material was observed in the vicinity.

### L41SN22 (Dam Site 19, South of Survey Unit B-185)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1585 feet/483 meters

Dimensions: Less than 1x1 meter

Description: Another small spring at the head of a short canyon, 120 meters southeast of L41SN21, issues at the same elevation and from the same aquifer. A very slow discharge of relatively fresh water was observed on June 9, 1981. The canyon floor below the spring is densely overgrown with juniper and tall grasses. No cultural material was observed in the vicinity.

### L41SN23 (Dam Site 19, Survey Unit A-194, A-203)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1490-1510 feet/454-460 meters

Dimensions: 900+ meters E-W by 50 meters N-S

Description: An extensive exposure of stream-rolled gravels are eroding from the streamward edge of an alluvial terrace deposit at the crest of the left-bank valley margin slope above North Croton Creek approximately 1 kilometer downstream of its confluence with Smelter Creek. The gravels are originating at a point approximately 15 meters above the present stream channel and are washing downslope to within 9 meters of its elevation. Upslope, the gravels are overlain by 50 to 75 centimeters of heavily calcified, fine sand alluvium which has probably experienced fairly severe erosion. A caliche matrix cements the gravels into a conglomerate, and the specimens which have washed free exhibit carbonate rinds. Isolated specimens of lithic debitage were seen to be intermixed with the exposed gravels at a very low density.

L41SN24 (Dam Site 14, Survey Units A-82, A-84, A-85, C-32)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1680-1700 feet/512-518 meters

Dimensions: Area A: 420 meters N-S by 100 meters E-W  
Area B: 480 meters E-W by 50 meters N-S

Description: Two areas of dense lag concentrations of stream-rolled gravels are at the confluence of Bitter Gulch and Salt Croton Creek. The long axes of the gravel beds are parallel to Salt Croton Creek above its right bank. Area A is on the left bank of Bitter Gulch, and Area B is on its right bank. The gravels lie atop nearly level bed-rock benches of Blaine Formation gypsum approximately 9 to 10 meters above the present Salt Croton Creek channel, and appear to have resulted from the recent deflation of fill terrace remnants. Few of the stones exhibit carbonate rinds. No cultural material was observed in association with the gravels.

L41SN25 (Dam Site 14, Survey Units A-77, A-79)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1670-1680 feet/509-512 meters

Dimensions: 300 meters E-W by 30 meters N-S

Description: A long, thin exposure of stream-rolled gravels is eroding from the base of a fill terrace above the right bank of Salt Croton Creek roughly 1.5 kilometers downstream of its confluence with Haystack Creek. The gravels are exposed approximately 6 meters above the present Salt Croton Creek channel. A mantle of roughly 1 meter of fine sandy loam terrace fill in which no soil horizonation has occurred

## APPENDIX II: LOCALITY DESCRIPTIONS

overlies the gravel. Few of the stones exhibit carbonate rinds. No cultural material was noted in association with the gravels.

### L41SN26 (Dam Site 14, Survey Units A-74, A-75, A-76, A-78)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1670-1720 feet/509-524 meters

Dimensions: 1275 meters NW-SE by 500 meters NE-SW

Description: A very broad lag concentration of stream-rolled gravels occurs above the left bank of Salt Croton Creek 500 to 1500 meters downstream from its confluence with Haystack Creek. The gravels apparently derive from two sources. Above 518 meters elevation, on the northern side of L41SN26, there is an extremely dense concentration of gravels forming a pavement over a moderately rolling landscape. Most of the stones exhibit carbonate rinds. It is likely that this higher portion of the gravel bed is the erosional remnant of a strath terrace. Gravels have been washed downslope from an elevation of 524 meters to one of 509 meters. Below that elevation within the southern portion of the locality is a broad, nearly level fill terrace. Stream-rolled gravels have been exposed in a moderate to low density by the deflation of its surface. Few of the specimens exhibit carbonate rinds, and this lower terrace is apparently of recent origin. The upper gravel exposure is concentrated 12 to 18 meters above the present Salt Croton Creek streambed, and the lower exposure is approximately 6 meters above the modern stream. No cultural material was observed on the lower portion of the locality. A moderate concentration of lithic debitage within the upper segment was recorded as site 41SN42. Isolated debitage specimens were also noted beyond the bounds of the site in the upper exposure only.

### L41SN27-30 (Dam Site 14, Survey Units A-65, A-66, A-67, B-54, B-55)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1690-1780 feet/515-543 meters

Dimensions: 1400 meters E-W by 1000 meters N-S

Description: A very broad, dense lag concentration of stream-rolled gravels surrounds the confluence of Salt Croton and Dove creeks. The material is most heavily concentrated on the slopes above the confluence, 12 to 15 meters above the modern streambeds. Gravels have washed downslope and onto the salt flats along the streams. Separate locality numbers were assigned in the field to the gravels in each survey unit as they were encountered, but there is, in fact, a single continuous distribution of material over the entire area. Most of the specimens exhibit carbonate rinds, and it is likely that the gravels are the erosional remnants of an early Holocene or Pleistocene terrace

system. Isolated specimens of lithic debitage and burned rocks were observed intermixed with the gravels, mostly at the lower elevations. Post-occupational slopewash undoubtedly accounts for this distributional trend; many of the contexts within which debitage was observed are of very recent origin. The composition of the gravels is as described in the Introduction, but many of the specimens are quite large and range up to 30 centimeters in diameter.

L41SN31 (Dam Site 19, Survey Units A-167, A-168)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1550-1580 feet/472-482 meters

Dimensions: 250 meters N-S by 125 meters E-W

Description: An exposure of stream-rolled gravels is eroding from the base of a high fill terrace remnant above the left bank of North Croton Creek approximately 1 kilometer upstream of its confluence with Wedington Creek. The gravel is originating approximately 15 meters above the modern streambed and is overlain by 4 to 6 meters of fine sand. Most of the gravels exhibit carbonate rinds, and there are weakly developed argillic and calcic horizons in the overlying alluvium. A dearth of silt and clay in the alluvium, rather than time, is probably responsible for the retarded nature of the soils development. Isolated specimens of lithic debitage were noted within the locality, and a concentration of occupational debris was recorded as site 41SN18.

L41SN32 (Dam Site 19, Survey Unit B-189)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1480-1490 feet/451-454 meters

Dimensions: 70 meters N-S by 1 meter E-W

Description: A profile of a low fill terrace above the right bank of North Croton Creek at its confluence with Wedington Creek is exposed along a roadcut. The surface of the terrace is 9 meters above the present North Croton and Wedington streambeds. Alluvial stratification of the fine sandy loam terrace fill is clearly visible throughout the profile. There is no apparent development of soil horizons. A nearby resident of 40 years, Bandy Bradley of Long Ranch, informed the crew that the terrace floods every decade or so and gains approximately 1 or 2 centimeters of sediment with each event. Thus, the terrace is actively and rapidly aggrading. It is highly unlikely that aboriginal sites would be found on the surfaces of such landforms. See also L41KG20.

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### L41SN33 (East Pipeline, Survey Unit C-38)

USGS Quadrangle: 7.5' Bob Creek 1959

Elevation: 1700-1730 feet/518-527 meters

Dimensions: 725 meters E-W by 620 meters N-S

Description: A broad, dense lag concentration of stream-rolled gravels occurs in the uplands to the north of Salt Croton Creek 2 kilometers north of its channel and 5 kilometers upstream of its confluence with the Salt Fork of the Brazos River. The gravels are in an intensely eroded badlands area which is virtually devoid of soil, and rest directly on a red shale of the Blaine Formation 12 to 15 meters above the present Salt Croton Creek channel. Most of the gravels exhibit carbonate rinds, and it is probable that the material represents the erosional remnant of an early Holocene or Pleistocene terrace. It is not clear whether that terrace was formed by Salt Croton Creek, the Salt Fork of the Brazos, or both. Isolated specimens of lithic debitage were found scattered among the gravels.

### L41SN34 (Dam Site 10, Survey Unit A-48)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1750-1760 feet/533-536 meters

Dimensions: 400 meters NW-SE by 100 meters NE-SW

Description: An exposure of stream-rolled gravels is eroding from the base of a fill terrace above the left bank of Croton Creek 2.5 kilometers upstream of its confluence with Salt Creek. The gravels originate at a point 10 meters above the present Croton Creek channel, and have washed downslope about 3 meters vertically and up to 100 meters horizontally. Approximately 2 meters of fine sandy loam terrace fill overlies the gravels at their points of origin and exhibits both cambic B and calcic horizons. Many of the gravels exhibit carbonate rinds. It seems likely that the terrace is of mid to early Holocene origin. No cultural material was observed at L41SN34.

### L41SN35 (Dam Site 10, Survey Units A-45, A-48, A-51)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800-1830 feet/549-558 meters

Dimensions: 1200 meters E-W by 200 meters N-S

Description: A dense, extensive lag concentration of stream-rolled gravels lies above the left bank of Croton Creek 2 to 3 kilometers upstream from its confluence with Salt Creek. The gravels follow the



crest of the valley margin scarp and originate at an elevation approximately 35 meters above the present channel of Croton Creek. The material has washed downslope to a point 21 meters above the modern stream. In places, up to 50 centimeters of heavily calcified fine sandy alluvium still accompanies the gravels, but through most of the locality they rest directly atop gypsum and poorly consolidated sandstone of the Whitehorse Group. Most of the gravels exhibit carbonate rinds, and it is probable that the material derives from a Pleistocene terrace. Isolated specimens of lithic debitage and burned rock were seen to be scattered about the locality.

L41SN36 (Dam Site 10, North of Survey Unit A-48)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1855 feet/565 meters

Dimensions: 2 meters N-S by 1 meter E-W

Description: A small concentration of nine dolomite slabs was found in the uplands to the north of Croton Creek roughly 2.5 kilometers upstream of its confluence with Salt Creek. The slabs are tabular and range from 5 to 10 centimeters in thickness and 30 to 70 centimeters in diameter. There are no visible signs of human modification of the slabs, and no cultural material was observed in the vicinity. However, it is difficult to account for their presence in this location other than by human intervention in view of the lack of outcrops of the material in the immediate area. The purpose for which the slabs may have been accumulated is unknown.

L41SN37 (Dam Site 10, Survey Unit B-46)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1750-1770 feet/533-540 meters

Dimensions: 70 meters N-S by 10 meters E-W

Description: A collapsed rockshelter occurs along the eastern canyon wall of a small, unnamed, left-bank tributary which enters Croton Creek roughly 3 kilometers upstream from its confluence with Salt Creek. A massive bed, the Eskota gypsum, forms the rim of the narrow, deep, steep-sided canyon. Lateral migration of the stream at its floor had undercut the gypsum at L41SN37 through erosion of the poorly consolidated sandstone of the Whitehorse Group which underlies it; this resulted in the formation of a rockshelter at some point in the past. The roof appears to have collapsed quite recently. The floor of the shelter appears to have been about 3 meters above the elevation of the streambed, and a talus slope of colluvium extends downslope at a steep angle to the stream. It is not clear how large an area may have been protected by the roof prior to its collapse. No cultural material was

## APPENDIX II: LOCALITY DESCRIPTIONS

observed in association with the shelter, but the talus slope is heavily overgrown with hackberry, mesquite and tall forbs, and is in part occupied by the large blocks of roof fall. It is certainly possible that the shelter may have been occupied while in existence, but such an assessment cannot be made on the basis of present surface indications.

### L41SN38 (Dam Site 10, Survey Units B-40, B-41, B-42, B-43)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1770-1810 feet/540-552 meters

Dimensions: Area A: 220 meters N-S by 75 meters E-W  
Area B: 120 meters N-S by 90 meters E-W  
Area C: 110 meters N-S by 70 meters E-W  
Area D: 200 meters E-W by 50 meters N-S  
Area E: 100 meters N-S by 50 meters E-W  
Area F: 125 meters N-S by 130 meters E-W  
Area G: 150 meters NE-SE by 50 meters NW-SE

Description: Seven adjacent exposures of stream-rolled gravels are distributed over an area roughly 1 kilometer in diameter along both margins of the Salt Creek canyon approximately 1 kilometer upstream of its confluence with Croton Creek. The gravels appear at a very low density at 21 to 24 meters above the present Salt Creek channel. A mantle of fine sandy loam alluvium apparently blankets this entire area, and the gravels have been intermittently exposed in areas of severe deflation. No profiles were available in which the terrace deposits could be examined for depth or soil formation, but most of the gravels exhibit carbonate rinds. Given that fact and the high elevation of the deposits, one would deduce that their origin probable dates to early Holocene or late Pleistocene times. The deposits at this locality are at roughly the same elevation as those exposed in L41SN35 and L41SN40 on the northern side of Croton Creek and may well be contemporaneous. No cultural material was noted in association with the gravels at L41SN38. In this regard, it is noteworthy that the high terraces to the north are much more severely deflated and offer much denser concentrations of lithic resources at the surface.

### L41SN39 (Dam Site 10, Survey Unit B-31)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800-1810 feet/549-552 meters

Dimensions: Area A: 400+ meters N-S by 30 meters E-W  
Area B: 500+ meters N-S by 30 meters E-W

Description: Two long narrow exposures of stream-rolled gravels are oriented parallel to one another and to Salt Creek above either bank approximately 5 kilometers upstream of its confluence with Croton Creek.

The gravel exposures extend beyond the bounds of the relevant survey unit, and their northern and southern termini were therefore not determined. The gravels are eroding from the bases of apparently shallow terraces of Salt Creek which originate 12 meters above its present channel and have washed downslope roughly 3 meters vertically and 30 meters horizontally. A moderately dense lag concentration has been formed. No exposures of the terrace profiles were available, but most of the gravels exhibit carbonate rinds. No cultural material was observed in association with the gravels.

L41SN40 (Dam Site 10, Survey Units A-51, A-52, A-54)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1800-1830 feet/549-558 meters

Dimensions: 575 meters NW-SE by 230 meters NE-SW

Description: An extensive lag concentration of stream-rolled gravels, virtually identical to that at L41SN35 and beginning roughly 200 meters to the east, is at the same elevation above the left bank of Croton Creek. The two deposits are now separated by a short narrow canyon but are undoubtedly of coeval origin. Refer to the description of L41SN35 for details of the character of the deposits.

L41SN41 (Dam Site 10, Survey Unit A-53)

USGS Quadrangle: 7.5' Seven Diamond L Canyon 1958

Elevation: 1750-1790 feet/533-546 meters

Dimensions: 550 meters NW-SE by 150 meters NE-SW

Description: A relatively diffuse lag concentration of stream-rolled gravels lies on the valley margin slope above the right bank of Croton Creek approximately 1 kilometer upstream of its confluence with Salt Creek. The gravels rest directly on sandstone of the Whitehorse Group, and any finer-textured alluvium which may have accompanied the gravels has been entirely removed by erosion. Most of the stones exhibit carbonate rinds. The gravels are distributed at 12 to 18 meters above the present Croton Creek channel. Isolated specimens of lithic debitage were observed within the locality, and two concentrations of aboriginal occupational debris which it incorporates have been recorded as sites 41SN13 and 41SN59.

L41SN42 (Dam Site 1, Survey Units A-87, C-33)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1660-1670 feet/506-509 meters

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Dimensions: 300 meters N-S by 60 meters E-W

Description: A broad lag concentration of stream-rolled gravels has resulted from the deflation of a 6-to-9-meter Salt Croton Creek terrace remnant approximately 500 meters downstream from its confluence with Bitter Gulch. The gravels are concentrated on the gently rolling terrace surface roughly 6 meters above the modern stream. The remaining terrace fill is less than 1 meter deep and rests on a bedrock bench of Blaine Formation sandstone. No soil horizonation is visible in the alluvium in a profile which has been cut by Salt Croton Creek along the western terrace margin, but it appears that deflation of the terrace has sufficiently lowered its surface to have removed any soil which may have existed. A small concentration of aboriginal occupational debris has been recorded to the immediate east as site 41SN64.

APPENDIX III: Artifact Analysis

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## INTRODUCTION

The original research design specified that artifact collections were not to be made as a matter of course during this project. Only aboriginal ceramics and exceptionally significant lithic tools were to be collected for laboratory analysis and curation. At the time that the design was formulated, it was presumed that the study area would be sufficiently remote to inhibit any serious private-collector activity. However, contacts with local residents during the prefield preparations clearly established that artifact hunting is a common pastime in the area. Chipped stone tools, particularly projectile points, are the primary targets of that activity. In reaction, such specimens were collected as a preservation measure throughout the course of the survey. No aboriginal ceramics were encountered.

The appendix which follows presents a detailed analysis of the 63 chipped stone tools collected during the survey. All of the specimens are surface finds. The collection is divided into a hierarchical series of largely descriptive categories as outlined in Table 32. Functional categories are eschewed for all but the projectile points; the intended uses of the other implements are debatable. Individual descriptions and dimensions are provided for the specimens in each category. The provenience of the collection is summarized in Table 33 which follows the analysis.

## ANALYSIS

### BIFACIAL TOOLS

All of the specimens exhibiting the clearly deliberate removal of flakes from both their ventral and dorsal faces are included in this major category.

#### Projectile Points

Bifaces which are stemmed for hafting and exhibit triangular, symmetrical blades are included in this grouping.

#### Arrow Points

Included are small thin projectile points less than 5 mm in maximum thickness which are light and gracile in overall character. Two specimens were recovered. The first is from site 41SN57 (Fig. 14b). The distal half of its blade is missing; the blade appears to have been narrow relative to its length, and the relatively straight edges exhibit coarse serration. The shoulders are pronounced. The stem is long (probably accounting for 25 percent of the original length of the specimen), narrow in proportion to its length, and exhibits pronounced beveling. The stem edges are straight and expand very slightly. The base is concave and forms two sharp points at the proximal extremity of the

### APPENDIX III: ARTIFACT ANALYSIS

TABLE 32  
COLLECTED CHIPPED STONE TOOL CLASSIFICATION

- I. Bifacial Tools
  - A. Projectile Points
    - 1. Arrow Points
    - 2. Dart Points
    - 3. Dart Point Fragments
  - B. Other Bifaces
    - 1. Group 1 Bifaces
    - 2. Group 2 Bifaces
    - 3. Group 3 Bifaces
    - 4. Burinated Biface
    - 5. Cobble Tool
- II. Unifacial Tools
  - A. Planoconvex Unifaces
    - 1. Lateral and Distal Retouch
    - 2. Lateral Retouch
  - B. Modified Flakes
    - 1. Retouched Flakes
      - a. Lateral and Distal Retouch
      - b. Lateral Retouch
    - 2. Edge-damaged Flake
  - C. Possible Gunflint

specimen. The specimen was manufactured from a light grayish brown fusulinid chert. It is morphologically identical to the historic Allen Phase type Cuney (Suhm and Jelks 1962:270-271) of eastern Texas. The dimensions of the specimen are as follows:

| <u>T*</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|-----------|----------|------------|-----------|-----------|-----------|-----------|
| 4         | 43*      | 18         | 8         | 10        | 7         | +1        |

\*All measurements are in millimeters. T = thickness; L = total length; MBW = maximum blade width; BW = base width (at proximal end of stem); HL = haft length; NW = neck width (stem width just below shoulders); BD = base depth (+ = concave, - = convex, 0 = straight). An asterisk (\*) following a number indicates an estimated measurement based on reconstruction of a fragmentary specimen.

The second specimen was recovered from Feature 21 at 41SN34 (Fig. 14a). Perhaps the distal third of the blade and a small fragment of the base are missing. The specimen was triangular in form with straight lateral edges; at least two opposing pairs of rectangular notches have been removed at right angles to the longitudinal axis of the specimen. A single broad, rectangular notch has been removed from the center of the base. The specimen was manufactured from a light grayish brown fusulinid chert. Typologically, it is classifiable as Huffaker (Bell 1960:58-59). The dimensions of the specimen are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 3        | 30*      | 14         | 14        | -         | -         | +2        |

#### Dart Points

These specimens are generally larger and heavier than arrow points and exhibit a maximum thickness equal to or greater than 5 mm. The 10 specimens recovered which retain intact or largely intact stems are discussed herein. The four recovered specimens which lack their stems are discussed in the succeeding section captioned Dart Point Fragments.

The first specimen is a stem fragment from site 41KG59 (Fig. 14d). The shape and size of the blade are unknown. The stem edges expand very slightly. A single relatively large flake has been removed from each side of the base to form a very strongly concave base with two rounded projections at the proximal extremity of the stem. The specimen was manufactured from a medium gray, aphanitic, Edwards-like chert. It is classifiable typologically as a Gower (Shafer 1963:64-65, Fig. 7). The dimensions of the specimen are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 6        | -        | -          | 19        | 17        | 16        | +6        |

The second specimen was found at site 41SN54 (Fig. 14g). The distal tip and portions of the shoulder and base are missing. The blade is moderately broad relative to its length; it has straight to very slightly concave edges and is strongly beveled on the left edge of each face. The shoulders are barbed. The removal of broad shallow corner notches formed a moderately expanding stem with slightly concave edges. The base is weakly concave with somewhat rounded corners. This specimen was manufactured from a medium gray fusulinid chert and is not typologically classifiable. Its dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 8        | 46*      | 28         | 17*       | 11        | 11        | +1        |

The third specimen is from site 41SN62 (Fig. 14f). The distal tip and the barbs are missing. The blade appears to have been broad relative to its length with straight to slightly convex edges and weak beveling to the left. The shoulders are strongly barbed. The removal



Figure 14. Arrow Points and Dart Points.

- a. Arrow point, classifiable as type Huffaker, 41SN34.
- b. Arrow point, similar to type Cuney, 41SN57.
- c. Dart point, similar to type Edgewood, 41KG58.
- d. Dart point, classifiable as type Gower, 41KG59.
- e. Dart point, not typologically classifiable, 41SN61.
- f. Dart point, similar to type Martindale, 41SN62.
- g. Dart point, not typologically classifiable, 41SN54.
- h. Dart point, classifiable as type Nolan, 41KG40.
- i. Dart point, not typologically classifiable, 41SN29.
- j. Dart point, similar to type Marshall, 41KG49.

Figure 14



*a*



*b*



*c*



*d*



*e*



*f*



*g*



LBH

*h*



*i*



*j*

### APPENDIX III: ARTIFACT ANALYSIS

of corner notches formed a stem with straight, strongly expanding edges. A moderately concave base which gently curves between two sharply pointed proximal extremities was formed through the removal of a series of long, narrow, collateral thinning flakes. In plan view, the stem exhibits the "double-convex" form characteristic of the Central Texas type Martindale (Suhm and Jelks 1962:212-213). The specimen was manufactured from a mottled light and dark brownish gray, highly silicified wood. The dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 6        | 45*      | 31*        | 17        | 11        | 14        | +2        |

The fourth specimen was recovered from site 41KG58 (Fig. 14c). It is complete but for one barb and one basal corner. The blade forms an equilateral triangle with slightly convex edges and moderately pronounced barbs. It is strongly beveled to the right. Removal of corner notches at roughly 45° angles relative to the longitudinal axis of the specimen produced a short stem with slightly convex, strongly expanding edges. It is weakly beveled to the left. The base is weakly concave with strongly pointed, almost laterally projecting basal corners. The base has been smoothed. The specimen was manufactured from a mottled red and white material, possibly Alibates agatized dolomite (c.f., Schaeffer 1958). Morphologically, the specimen closely resembles projectile points classified as the type Edgewood (Bell 1958:20-21; Suhm and Jelks 1962:182-183) to the east and northeast of the study area. Its dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 5        | 30       | 23         | 17        | 7         | 12        | +1        |

The fifth specimen was found on the surface of site 41SN61 (Fig. 14e). The tip and one basal corner are missing. The blade is somewhat asymmetrical, has moderately convex edges, and is rather broad relative to its length. Its shoulders are pronounced and weakly barbed. The removal of two poorly controlled corner notches at roughly 45° angles relative to the longitudinal axis of the specimen produced a short stem with concave, strongly expanding edges. The base is weakly concave, and the basal corners were apparently squared. The specimen was manufactured from a medium gray fusulinid chert and is not typologically classifiable. Its dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 5        | 38*      | 29         | 20        | 8         | 16        | +1        |

The sixth specimen was recovered from site 41KG49 (Fig. 14j). The tip and barbs are absent. The blade is narrow relative to its length, has straight edges, and is weakly beveled to the right. The shoulders are well pronounced and appear to have been strongly barbed. Two corner notches were removed at angles of approximately 35° relative to the longitudinal axis of the specimen to form a very short, moderately

expanding stem with straight edges. The base is slightly concave, and the basal corners are sharply pointed. The specimen was manufactured from a mottled, medium to dark gray fusilinid chert. It is possibly classifiable as the type Marshall (Suhm and Jelks 1962:210-211) although the stem is somewhat more strongly expanding than is characteristic of that type. The dimensions of the specimen are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 5        | 58*      | 29*        | 17        | 8         | 14        | +1        |

The seventh specimen is from the surface of site 41SN29 (Fig. 14i). Only a tiny fragment of the tip is missing. The blade is narrow relative to its length and has strongly convex edges. The shoulders are weak and are not barbed. The stem is short, weakly contracting, and has convex edges. The base is slightly concave. The basal corners are poorly defined and rounded. The specimen was manufactured from a light brownish gray fusilinid chert and is not typologically classifiable. Its dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 7        | 71*      | 28         | 13        | 10        | 18        | +1        |

The eighth specimen was found at site 41KG52. One basal corner is missing. The blade is narrow relative to its length, has very strongly convex edges, and is quite strongly beveled to the right. The shoulders are indistinct and are not barbed. The stem is relatively long and narrow with nearly parallel straight edges. The base is strongly concave, and the basal corners form sharp points oriented parallel to the longitudinal axis of the specimen. This specimen was manufactured from a medium gray fusilinid chert and is not typologically classifiable. Its dimensions are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 9        | 43       | 21         | 14        | 15        | 15        | +2        |

The ninth specimen of this category was recovered from site 41SN50. Nearly all of the blade, both barbs, and one basal corner are missing. The blade form is largely undeterminable, but it appears to have been broad. The shoulders are strongly pronounced and seem to have terminated in broad, square barbs which were very nearly parallel to the longitudinal axis of the specimen. The stem was produced by the removal of two long, narrow corner notches at roughly 20° angles relative to the longitudinal axis. The stem is broad in proportion to its length and has moderately expanding, straight edges. The base is moderately convex, and the basal corners are angular. The specimen was manufactured from a medium gray fusilinid chert; it appears to be morphologically similar to the Central Texas type Castroville (Suhm and Jelks 1962:172-173). The dimensions of the specimen are as follows:

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| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 7        | -        | 35*        | 22        | 9         | 19        | -2        |

The tenth and final dart point was recovered from the surface of site 41KG40 (Fig. 14h). A small portion of one blade edge is missing. The blade is very narrow relative to its length, has moderately convex edges, and is weakly beveled to the right. The shoulders are indistinct. The stem is weakly contracting, has slightly concave edges, and is weakly beveled to the right. The base is weakly convex, and the basal corners are angular. The specimen was manufactured from a mottled light and medium gray fusilinid chert. It is classifiable as the type Nolan (Suhm and Jelks 1962:224-225). The dimensions of the specimen are as follows:

| <u>T</u> | <u>L</u> | <u>MBW</u> | <u>BW</u> | <u>HL</u> | <u>NW</u> | <u>BD</u> |
|----------|----------|------------|-----------|-----------|-----------|-----------|
| 6        | 56       | 19         | 12        | 14        | 18        | -1        |

#### Dart Point Fragments

Four fragments of dart points were collected which lack most or all of the stem. The first is a medial fragment from which approximately half of the blade, one barb, and nearly all of the stem are missing. It was recovered from 41KG54. The blade appears to have been broad with straight edges and is beveled to the right. The shoulders are barbed. The specimen is corner-notched at roughly a 45° angle relative to its longitudinal axis, and the stem probably expanded. This was a large dart point estimated to have been 5 to 6 cm in total length and 4 to 4.5 cm in maximum blade width. The only dimension definitely ascertainable is its thickness, which is 5 mm. The specimen was manufactured from a medium gray fusilinid chert.

The second specimen is from 41SN35; it appears to have been quite similar in form to the previous fragment but is somewhat smaller. The distal half of the blade, one barb, and the proximal half of the stem are all missing. The blade was broad with slightly convex edges and is beveled to the right. The shoulders are strongly barbed. Removal of corner notches at roughly 50° angles relative to the longitudinal axis of the specimen produced a strongly expanding stem. Total length of the specimen was probably about 4 to 5 cm, and maximum blade width was 3.5 to 4 cm. Its thickness is 5 mm. The specimen was manufactured from Tecovas jasper.

The third specimen was found on the surface of 41SN34. It is a very small medial blade fragment from which all of the stem, 75 to 80 percent of the blade, and both barbs are missing. The blade appears to have been relatively broad, and the specimen was probably corner-notched. Only the thickness can be accurately quantified; it is 5 mm. The specimen was manufactured from a medium brown fusilinid chert.

The fourth and final specimen was recovered from site 41SN45. The tip and the proximal half of the stem are missing. The blade is narrow

with straight to slightly convex edges, and is strongly beveled to the right. Removal of broad, shallow side notches formed weakly pronounced, unbarbed shoulders and a moderately expanding stem. The form of the base cannot be determined. Total length of the specimen was approximately 45 mm, its maximum blade width is 19 mm, and its thickness is 7 mm. The specimen was manufactured from a pale reddish brown fusulinid chert. It is impossible to provide a definite typological classification of the specimen in the absence of its base, but the preserved attributes suggest an affinity with the type Trinity (Suhm and Jelks 1962:252-253).

#### Other Bifaces

Included in this major category are all of the bifacially modified chipped stone implements other than the projectile points (n = 18). There is considerable variation in the morphology of these specimens. The bulk of the collection is divided into three stage-of-reduction categories; these are simply designated Groups 1, 2 and 3. Within each group, the specimens are individually described. Finally, two tools, a burinated biface and a bifacial cobble tool, are treated separately.

#### Group 1 Bifaces

These five specimens are manufacturing failures which appear to have been discarded during the earliest stages of reduction. All are thick and have sinuous, irregular edges. None exhibit use-wear, and the flaw or manufacture error responsible for the rejection of each specimen is obvious. The technique of reduction appears uniformly to have been hard-hammer percussion.

The first specimen is from the surface of 41KG36 (Fig. 15g). It is a large cortex-platform percussion flake of mottled gray and white fusulinid chert. It is subtriangular in outline with moderately convex edges and a straight base. The latter is formed by the platform on which cortex is retained. The specimen is otherwise entirely decorticate. There is a large knot in the center of the dorsal face which shows evidence of attempted removal from three directions. The dimensions of the specimen are as follows:

| <u>L*</u> | <u>W</u> | <u>T</u> |
|-----------|----------|----------|
| 62        | 33       | 14       |

The second specimen is a bifacially reduced pebble of mottled light and medium gray aphanitic chert from 41KG48 (Fig. 15h). It is roughly elliptical in outline. One small patch of cortex, approximately 1 square centimeter in area, is still present at one end. The flaking characteristics of the material were apparently quite unpredictable, and

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\*All measurements are again in millimeters. L = maximum length; W = maximum width; and T = maximum thickness.

Figure 15. Other Bifaces.

- a. Group 3 biface; 41KG35.
- b. Group 3 biface; 41KG41.
- c. Burinated biface; 41SN43.
- d. Group 2 biface; 41KG49.
- e. Group 2 biface; 41SN45.
- f. Group 2 biface; 41KG37.
- g. Group 1 biface; 41KG36.
- h. Group 1 biface; 41KG48.
- i. Group 1 biface; 41SN23.

Figure 15



*a*



*b*



*c*



*d*



*e*



*f*



*g*



*h*



*i*

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the specimen was discarded after two large hinge fractures drastically altered its form. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 62       | 33       | 21       |

The third specimen is a large flake of Ogallala quartzite (or Potter chert) from 41SN23 (Fig. 15i). Its outline is that of an elongated oval, rounded at either end. Again, the material was quite unpredictable; two fatal hinge fractures led to the rejection of the specimen. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 74       | 30       | 13       |

The fourth specimen is from site 41SN60. It is an entirely decorticate fragment of medium gray Ogallala quartzite and is probably a flake derived from a large cobble. The present form of the specimen is rather irregular, but it was probably intended to be somewhat oval in outline. Flaws in the material caused the loss of both the proximal and distal ends at a very early point in the thinning process. The dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 49       | 36       | 16       |

The fifth and final Group 1 biface is from site 41SN65. Like the previous specimens, it is an entirely decorticate fragment of Ogallala quartzite that appears to be a flake, but subsequent thinning has removed most or all of the original surface. This initial thinning also exposed several internal material flaws, leading to the rejection of the specimen. It is roughly oval in outline, and its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 47       | 29       | 15       |

#### Group 2 Bifaces

Included herein are six bifacial failures which appear to have been rejected fairly late in the reduction process. As a group, these specimens are much thinner than the Group 1 bifaces, are of more regular outline, and exhibit less sinuous edges. All exhibit a combination of both soft- and hard-hammer flake scars. There is no use wear visible on any of the specimens.

The first of the Group 2 bifaces is a small specimen of pale red, fine-grained, vitreous quartzite from the surface of site 41KG37 (Fig. 15f). It is laurelate in outline, pointed on the distal end, and

rounded on the proximal end. The edges are slightly to moderately convex. A broad knot on one face suggests this piece is a manufacturing failure. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 44       | 21       | 10       |

The second specimen was found at site 41KG49 (Fig. 15d). It was manufactured from a dark red, very fine-grained quartzite. It is subtriangular in outline and is quite narrow with weakly convex edges and base. Again, a resistant knot of material at the center of one face led to its rejection. The dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 57       | 21       | 9        |

The third specimen, from site 41SN20, was manufactured from a large hard-hammer percussion flake of medium gray Ogallala quartzite. It is subtriangular in outline with moderately convex edges and base and rounded basal corners. The specimen was rejected during final thinning due to the inability of the knapper to reduce the original bulb of percussion. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 69       | 34       | 14       |

The fourth specimen in this category is from site 41SN45 (Fig. 15e). It is ovaloid in outline, broad relative to its length, and was manufactured from a small hard-hammer percussion flake of medium gray fusulinid chert. A resistant knot was also responsible for the rejection of this specimen. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 31       | 27       | 9        |

The fifth specimen was recovered from site 41SN46. It is not clear whether the tool was manufactured from a flake or a pebble, but the material is a medium gray fusulinid chert. The outline is an elongated oval, and the specimen is strongly beveled to the right. It was nearly complete when rejected; most of the larger thinning flake scars have been smoothed over by fine pressure retouch. The shattering of one edge led to the rejection of the specimen, and the opposing edge appears to have been damaged at a later date. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 35       | 18       | 8        |

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The sixth and final Group 2 biface is from the surface of site 41SN50. It was manufactured from a fragment (probably a flake) of porous, mottled, light and medium gray aphanitic chert. Absorption of iron oxide from the soil has stained the specimen red subsequent to its aboriginal modification, but the original color of the material can be seen in a recent edge-damage scar. The biface would probably have been an elongated oval in outline upon completion, but was broken in half during the final soft-hammer percussion thinning. The proximal or basal half of the specimen was recovered. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 29       | 20       | 8        |

#### Group 3 Bifaces

The Group 3 bifaces comprise five fragments of tools which appear to have been finished. All have been completely thinned, have no obvious flaws, and all exhibit pressure retouch along their edges. All but one specimen (that from 41KG35) exhibit use-wear along their edges.

The first specimen is a proximal fragment from site 41KG35 (Fig. 15a). The raw material is Ogallala quartzite which is medium gray mottled with pale red. The outline of the fragment is parabaloid, but the intact specimen was probably of an ovaloid form. The angles of the edges are acute (35°), and the specimen is relatively thin; this infers that it was intended to serve as a cutting tool. However, no use-wear is visible along the edges. Dimensions of the specimen are as follows (length is that of the fragment; original length is unknown):

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 27       | 35       | 10       |

The second specimen was recovered from the surface of site 41KG41 (Fig. 15b). It is the distal portion of a thin biface manufactured from a medium gray fusilinid chert. The fragment is triangular in shape and has a sharply pointed tip and weakly convex edges. It is rather narrow, thin, and carefully retouched. The edge angles are acute (24°). The specimen could easily be a dart point blade fragment, but there is a moderate polish visible along both edges which suggests use as a tool for cutting relatively soft materials. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 43       | 24       | 6        |

The third specimen is a small biface fragment from the surface of site 41KG52. It is an edge fragment of a biface that was manufactured from a light gray fusilinid chert. The fragment is thick and exhibits a steep edge angle (44°). The preserved section of the edge is only 31 mm long, and only 15 mm width of the blade adjacent to the edge remains.

It is difficult to reconstruct the original form of the biface, but the edge is strongly excurvate and a basal fragment may be represented. Microscopically, the edge exhibits numerous small areas of shatter along the highlights, and tiny striations are oriented parallel to the edge. Use as a tool for cutting durable materials is suggested. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 31       | 1.5      | 12       |

The fourth specimen, found at site 41KG54, was manufactured from a mottled, medium gray and medium brown silicified palm wood. It is a medial blade fragment of a biface which was relatively thin with a broad, triangular blade. Apparent thickness of the blade is probably deceptively low, however, as post-manufacture damage has removed much of one face. The edges are slightly convex and exhibit acute angles (30°). The preserved sections of edge, each approximately 10 mm long, are moderately polished and suggest use of the tool for cutting soft materials. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 15*      | 33       | 7        |

The fifth and final specimen, from 41SN45, is a very small edge fragment of a biface that was manufactured from a medium gray fusilinid chert. The fragment is too small to permit a determination of the original form of the biface. The specimen was carefully thinned and re-touched. The preserved section of edge, 17 mm long, is moderately excurvate and exhibits a very acute edge angle (25°) and moderate polish. Use as an implement for cutting soft materials is suggested. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 17       | 13       | 5        |

#### Burinated Biface

A large hard-hammer flake, approximately 35 mm long and triangular in shape, was struck from a prepared platform core of pale gray fusilinid chert. Bifacial thinning of both edges and the distal end of the flake was effected, and then two burin spalls were struck from the original platform, removing 80 to 90 percent of each edge. The effect has been to produce a tool with burin projections at the distal end of either edge, and a moderately acute (30°) bifacially thinned tip (Fig. 15c). The entire edge between the projections and around the distal tip exhibits intense polish. This specimen was recovered from site 41SN43

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\*Follows orientation of presumed longitudinal axis.

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which is believed to represent a Paleoindian component. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 33       | 24       | 8        |

#### Cobble Tool

A large wedge-shaped cobble of medium gray silicified wood, roughly rectangular in outline, has been bifacially modified, presumably for use as a tool. Five to six broad hard-hammer percussion flakes were removed from either face of the thinner end of the cobble to produce a strongly convex steep (55°) bit. The cobble is otherwise unmodified. Substantial shatter is visible along the bit, but this could easily have resulted from the removal of the flakes which formed it. This specimen was recovered from the surface of site 41KT25. Its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 107      | 85       | 38       |

#### UNIFACIAL TOOLS

Included in this category are 29 tools, manufactured from flakes, which exhibit no additional modifications on their ventral surfaces.

#### Planoconvex Unifaces

Eleven unifaces were recovered which exhibit strongly convex dorsal surfaces. In most cases this pronounced convexity is the intentional result of unifacial thinning and edge retouch designed to produce steep working edges.

#### Lateral and Distal Retouch

Seven of the planoconvex unifaces exhibit retouch along their distal edges and one or both lateral edges. As a group, the specimens tend to be proportionately thicker than the four specimens which have retouch only along their lateral edges (described in the next section of this appendix). Traditionally, specimens like those treated in the present section have been informally termed "Plains end scrapers."

The first specimen was recovered from the surface of 41KT24 (Fig. 16a). It was manufactured from a very thick, cortex-platform, hard-hammer percussion flake of light gray aphanitic chert. The specimen was percussion flaked into a truncated ovaloid form with a strongly convex bit at the distal end. Retouch along that end and along the left edge has produced an extremely steep (75-80°) shelving edge. The apices of both retouched edges exhibit a light polish. This is by far the thickest of the unifaces and is morphologically similar to specimens casually

referred to as "turtle-backs." Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 52       | 44       | 26       |

The second specimen is from the surface of 41KG41. It was manufactured from a hard-hammer percussion flake of a medium gray, fine-grained orthoquartzite. One flake was removed from the ventral face to reduce the bulb, and several large percussion flakes were removed from the proximal end of the dorsal face to reduce its width. The resultant specimen is ovaloid in form with moderately convex distal and lateral edges. The distal and left lateral edge have been retouched to produce steep (55-65°) shelving bits. Both retouched edges are moderately polished at their apices. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 66       | 46       | 21       |

The third specimen is a bit fragment from 41SN32 which probably represents approximately one-fifth of the original implement. It was manufactured from a medium gray fusulinid chert. Post-manufacture damage has obliterated most of the ventral surface. Modification of the dorsal surface appears to have been quite carefully controlled with soft-hammer percussion used to produce a fairly tabular cross section. Finely controlled pressure flaking produced a very steep (75-80°) working edge. Nothing can be determined of the outline of the specimen except that the edges were strongly convex. The apex of the edge is intensely shattered from use. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 27       | 25       | 13       |

The fourth specimen is a complete tool from the surface of site 41SN48 (Fig. 16b). It was manufactured from a hard-hammer percussion, corticate flake of pale gray, coarse-grained metaquartzite. Efforts to reduce the bulb obliterated the platform and roughly half of the ventral face as a result of shattering along cleavage planes. Much of the dorsal face is corticate. Percussion flaking shaped the specimen into a subtriangular outline. Final retouch produced steep shelving bits on all three sides: 75° at the distal end and 60-65° on the lateral edges. All of the edges are moderately polished at their apices. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 46       | 43       | 18       |

Figure 16. Planoconvex Unifaces.

- a. Lateral and distal retouch; 41KT24.
- b. Lateral and distal retouch; 41SN48.
- c. Lateral and distal retouch; 41SN58.
- d. Lateral retouch; 41KT17.
- e. Lateral retouch; 41KT21.
- f. Lateral retouch; 41KG48.

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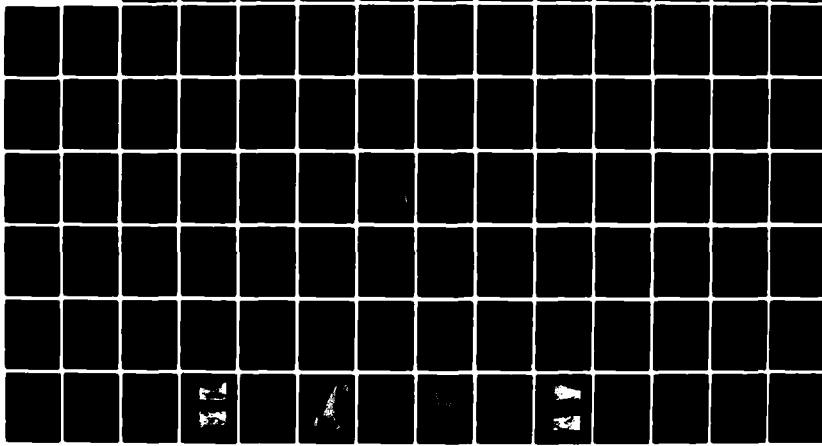




Figure 16



*a*



*b*



*c*



*e*



LBH

*d*



*f*

### APPENDIX III: ARTIFACT ANALYSIS

The fifth specimen was recovered from site 41SN58 (Fig. 16c). It was manufactured from a hard-hammer percussion, partially decorticate flake of medium gray fusilinid chert. The left lateral edge of the specimen is formed by the unreduced cortex platform of the flake. The outline of the specimen is therefore irregular; only the distal and right lateral edges have been shaped and retouched. The distal edge is strongly convex and extremely steep at 81°, and the right lateral edge is nearly straight and moderately steep at 64°. Shelving pressure retouch extends around both prepared edges, and the apices of the edges are moderately polished. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 45       | 27       | 15       |

The sixth specimen, from 41SN68, was manufactured from a decorticate hard-hammer percussion flake of dark gray aphanitic chert. Approximately half of the specimen is missing; the distal and right lateral edges and a portion of the proximal edge are all present. The intact tool was probably subrectangular in outline with a strongly convex, very steep (75°) distal edge and weakly convex, moderately steep (60-65°) lateral and proximal edges. The specimen was shaped through soft-hammer percussion, and the edges were then intermittently retouched to form shelving bits. Segments of the distal, lateral and proximal edges exhibit intense, minute shatter which presumably resulted from the use of the tool. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 36       | 24       | 14       |

The seventh and final specimen, also from 41SN68, was manufactured from a decorticate hard-hammer percussion flake of dark brownish gray fusilinid chert. Several flakes were removed from the ventral surface to reduce the bulb of percussion. Soft-hammer percussion was then utilized to form a tool which is wedge-shaped in cross section, thickened toward the distal end, and subrectangular in outline. Finally, the distal and right lateral edges were retouched to produce a continuous, shelving bit at an edge angle of 80-83°. This segment of the edge also exhibits intense minute shatter which is attributed to use wear. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 24       | 14       |

#### Lateral Retouch

Four planoconvex unifaces were recovered on which the edge retouch is limited primarily to a single lateral edge. Traditionally, such implements have been referred to as "side scrapers" by students of the area. Although variable in size and raw material, the four specimens are quite similar to one another in morphology. In all four cases a

large hard-hammer percussion flake was struck from a core. Limited percussion flaking was used to reduce the thickness of the specimen and form an even, moderately convex right lateral edge. Finally, that edge was retouched to form a weakly shelving, moderately steep (51-55°) working edge. On all of the specimens this edge exhibits intense minute shatter which presumably resulted from use of the tool.

The first specimen, from 41KT12, was manufactured from a medium brown, medium-grained orthoquartzite. The specimen is entirely decorticate. The edge angle of the right lateral edge is 55°, and its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 68       | 44       | 20       |

The second specimen, from 41KT17 (Fig. 16d), was manufactured from a light gray, Edwards-like aphanitic chert. The specimen is entirely decorticate but contains clasts of calcium carbonate. The edge angle of the right lateral edge is 54°, and its dimensions are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 80       | 64       | 23       |

The third specimen, from 41KT21 (Fig. 16e), was manufactured from a black metamorphosed siltstone. Approximately two-thirds of the dorsal face is corticate, thinning is limited to the margins. The edge angle of the right lateral edge is 51°, and the dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 59       | 38       | 17       |

The fourth specimen, from 41KG48 (Fig. 16f), was manufactured from a medium gray Ogallala quartzite. Approximately half of the dorsal face is corticate; thinning is limited to its margins. The edge angle of the right lateral edge is 53°, and the dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 57       | 37       | 15       |

#### Modified Flakes

Included within this major heading are 17 small simple flake tools. As a group, the specimens are much thinner and of less regular shape than the planoconvex unifaces. Most appear to be tools of convenience which involved little or no use-specific preparation.

### APPENDIX III: ARTIFACT ANALYSIS

#### Retouched Flakes

Nine of the modified flakes exhibit careful pressure retouch along one or more edges; clearly, this was intended to prepare those edges for use.

#### Lateral and Distal Retouch

Edge preparation is visible on both the distal edge and one or both lateral edges of six of the retouched flakes. The specimens are irregular to approximately subrectangular in outline and are generally tabular in cross section. Their edges are moderately convex to irregular and tend to be steep; the mean edge angle for the class is  $71^\circ$ . At best, a few percussion flakes were struck to rough out the form of the implement, and then pressure retouch was utilized to prepare edges of the desired angle. All of the specimens exhibit intense minute shatter along the apices of the prepared edges; this suggests use in working relatively durable materials.

The first of these specimens, from site 41KT21 (Fig. 17c), was manufactured from a decorticate soft-hammer percussion flake of mottled pale red and medium gray fusilinid chert. It is roughly subrectangular in outline with retouch along its distal and both lateral edges. The angle of the left edge is  $31^\circ$ ; that of the distal edge is  $67^\circ$ ; and that of the right edge is  $59^\circ$ . Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 32       | 25       | 7        |

The second specimen, from site 41KG48 (Fig. 17a), was manufactured from a decorticate hard-hammer percussion flake of medium gray Edwards-like aphanitic chert. The outline is quite irregular, and it has been retouched on the distal and both lateral edges. The angle of the left edge is  $49^\circ$ ; that of the distal edge is  $69^\circ$ ; and that of the right edge is  $70^\circ$ . Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 38       | 20       | 6        |

The third specimen, also from 41KG48 (Fig. 17b), was manufactured from a hard-hammer percussion corticate flake of translucent medium brown jasper. Unlike the other tools in this category, the specimen is rather wedge-shaped in cross section. It is subrectangular in outline and is quite narrow relative to its length. The distal edge and both lateral edges have been retouched, producing edge angles of  $83^\circ$  for the left lateral edge,  $84^\circ$  for the distal edge, and  $65^\circ$  for the right lateral edge. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 58       | 27       | 12       |

The fourth specimen, from 41SN28, was manufactured from a decorticate hard-hammer percussion flake of dark gray fusilinid chert. It is irregular in outline and has been retouched along its distal and right lateral edges, producing edge angles of 70° and 75°, respectively. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 27       | 7        |

The fifth specimen, from 41SN64, was manufactured from a partially decorticate flake of variegated, medium brown and dark gray silicified wood. It is irregular in outline and has been retouched along its distal and both lateral edges. The angle of the left lateral edge is 90°; that of the distal edge is 90°; and that of the right lateral edge is 82°. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 33       | 8        |

The sixth and final specimen, from 41SN64, was manufactured from a partially decorticate flake of variegated, medium brown and dark gray silicified wood. It is roughly subrectangular in outline with retouch along the distal and both lateral edges. The angle of the left lateral edge is 70°; that of the distal edge is 71°; and that of the right lateral edge is 81°. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 25       | 7        |

#### Lateral Retouch

Three of the retouched flakes exhibit edge retouch only along one or both lateral edges. All are irregular in shape and very weakly planoconvex in cross section. The edge angles of the specimens are moderately steep, ranging from 59° to 64°. Again, these specimens exhibit intense minute shatter along the apices of the retouched edges, presumably resulting from use in working durable materials.

The first specimen, from site 41KG51, was manufactured from a decorticate hard-hammer percussion flake of medium gray Ogallala quartzite. It has been retouched along the right lateral edge, producing an edge angle of 59°. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 24       | 22       | 6        |

The second specimen, from 41KG52 (Fig. 17e), was manufactured from a large partially decorticate hard-hammer percussion flake of medium gray fusilinid chert. It has been retouched along the left

Figure 17. Other Unifaces.

- a. Retouched flake, lateral and distal retouch, 41KG48.
- b. Retouched flake, lateral and distal retouch, 41KG48.
- c. Retouched flake, lateral and distal retouch, 41KT21.
- d. Retouched flake, lateral retouch; 41SN66.
- e. Retouched flake, lateral retouch; 41KG52.
- f. Edge-damaged flake; 41SN58.
- g. Edge-damaged flake; 41KG49.
- h. Edge-damaged flake; 41SN36.
- i. Possible gunflint; 41KT24.

Figure 17



*a*



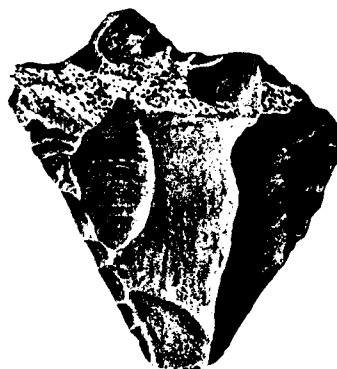
*b*



*c*



*d*



*e*



*f*

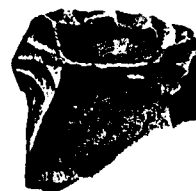


*g*

LBH



*h*



*i*

### APPENDIX III: ARTIFACT ANALYSIS

lateral edge to produce an edge angle of 59°. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 53       | 49       | 9        |

The third specimen, from 41SN66 (Fig. 17d), was manufactured from a decorticate hard-hammer percussion flake of medium gray fusilinid chert. It has been retouched along both lateral edges, producing edge angles of 59° along the left edge and 64° along the right edge. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 33       | 5        |

#### Edge-damaged Flakes

This final group of modified flakes incorporates eight specimens which exhibit no edge modification other than use-related damage. All of the specimens are irregular in outline, but there is considerable variation in dimensions, edge angles and character of edge damage within the class.

The first specimen, from 41KG42, is a partially decorticate hard-hammer percussion flake of variegated medium and dark brown silicified palm wood. The convex right lateral edge, at an angle of 78°, exhibits intense minute shatter along a 14-mm span of its apex. The distal edge, at an angle of 89°, exhibits similar shatter along an 11-mm span of its apex. Dimensions of the specimens are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 36       | 30       | 13       |

The second specimen, from 41KG49 (Fig. 17g), is a partially decorticate hard-hammer percussion flake fragment of Edwards-like medium gray aphanitic chert. Its entire left lateral edge, at an angle of 69°, exhibits intense minute shatter along its apex which is sequentially succeeded by a moderate polish of the highlights. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 34       | 17       | 5        |

The third specimen, from site 41KG51, is a decorticate hard-hammer percussion flake fragment of mottled medium gray and white aphanitic chert. The right lateral and distal edges, at angles of 62° and 54°, respectively, exhibit intense minute shatter along their apices. The left lateral edge, at an angle of 55°, exhibits a moderate polish of its apex. Dimensions of the specimen are as follows:



| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 28       | 27       | 7        |

The fourth specimen, also from 41KG51, is a decorticate hard-hammer percussion flake of variegated dark red and light gray silicified wood. The left lateral edge, at an angle of 50°, exhibits intense minute shatter along a 14-mm span of its apex. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 29       | 27       | 7        |

The fifth specimen, from 41SN32, is a partially decorticate hard-hammer percussion flake of light reddish-gray fusilinid chert. The left lateral edge, at an angle of 62°, exhibits intense minute shatter along a 19-mm span of its apex. The right lateral edge, at an angle of 54°, exhibits similar shatter along a 12-mm span of apex. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 21       | 19       | 8        |

The sixth specimen, from 41SN36 (Fig. 17h), is a large, partially decorticate, hard-hammer percussion flake of medium brownish gray fusilinid chert. The right lateral edge, at an angle of 51°, exhibits intense minute shatter along a 44-mm span of its apex. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 48       | 38       | 14       |

The seventh specimen, from 41SN56, is a partially decorticate bipolar percussion flake of medium gray Edwards-like aphanitic chert. The left lateral edge, at an angle of 82°, exhibits intense minute shatter along a 14-mm span of its apex. The right lateral edge, at an angle of 52°, exhibits similar shatter along a 17-mm span of its apex. Dimensions of the specimen are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 30       | 16       | 10       |

The eighth specimen, from 41SN58 (Fig. 17f), is a decorticate hard-hammer percussion flake of mottled medium brown, medium red and white Tecovas jasper. The left lateral edge, at an angle of 81°, exhibits intense minute shatter along a 26-mm span of its apex. The right lateral edge, at an angle of 69°, exhibits similar shatter along an 18-mm span of its apex. Dimensions of the specimen are as follows:

### APPENDIX III: ARTIFACT ANALYSIS

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| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 37       | 17       | 7        |

#### Possible Gunflint

A specimen was recovered from the surface of site 41KT24 which may represent a gunflint of aboriginal manufacture (Fig. 17i). It was manufactured from a hard-hammer percussion flake of a light brown aphanitic chert containing numerous small mottles of white, which is probably of local origin. The specimen is fragmentary with perhaps the proximal one-half to one-third missing. It is rectangular in outline with well-defined corners and slightly convex edges. The fragment is prismatic in cross section with a planar ventral surface. The dorsal face exhibits steep beveling along the distal and both lateral edges; the beveling was executed by means of carefully controlled hard-hammer percussion. The angle of the left lateral edge is 70°; that of the distal edge is 64°; and that of the right lateral edge is 66°. There is intense shattering along the apex of the distal edge. Dimensions of the fragment are as follows:

| <u>L</u> | <u>W</u> | <u>T</u> |
|----------|----------|----------|
| 27       | 27       | 7        |

TABLE 33  
COLLECTED CHIPPED STONE TOOL PROVENIENCE, KENT, KING AND STONEWALL COUNTY SITES

| Class                    | 41KT12 | 41KT17 | 41KT21 | 41KT24 | 41KT25 | 41KG35 | 41KG36 | 41KG37 | 41KG40 | 41KG41 | 41KG42 | 41KG48 | 41KG49 | 41KG51 | 41KG52 | 41KG54 | 41KG58 | 41KG59 | TOTAL |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Arrow Point              | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     |
| Dart Point               | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | 1      | -      | 1      | -      | 1      | 1      | 5     |
| Dart Point Fragment      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | 1     |
| Group 1 Biface           | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | 2     |
| Group 2 Biface           | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | 2     |
| Group 3 Biface           | -      | -      | -      | -      | -      | 1      | -      | -      | -      | 1      | -      | -      | -      | -      | 1      | 1      | -      | -      | 4     |
| Burinated Biface         | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     |
| Cobble Tool              | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1     |
| Planoconvex Uniface      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 2     |
| Lateral & Distal Retouch | -      | -      | -      | 1      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 4     |
| Lateral Retouch          | 1      | 1      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | 4     |
| Retouched Flake          | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 3     |
| Lateral & Distal Retouch | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 2      | -      | -      | -      | -      | -      | -      | 2     |
| Lateral Retouch          | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | 1      | -      | -      | -      | 4     |
| Edge-Damaged Flake       | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | 1      | 2      | -      | -      | -      | -      | 1     |
| Possible Gunflint        | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1     |
| TOTAL                    | 1      | 1      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 2      | 1      | 4      | 3      | 3      | 3      | 2      | 1      | 1      | 31    |

Table 33, continued

| Class                    | 41SN20 | 41SN23 | 41SN28 | 41SN29 | 41SN32 | 41SN34 | 41SN35 | 41SN36 | 41SN43 | 41SN45 | 41SN46 | 41SN48 | 41SN50 | 41SN54 | 41SN57 | 41SN58 | 41SN60 | 41SN61 | 41SN62 | 41SN64 | 41SN65 | 41SN66 | 41SN69 | TOTAL | GRAND TOTAL |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------------|
| Arrow Point              | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 2     | 2           |
| Dart Point               | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | 1      | -      | -      | -      | 1      | 1      | -      | -      | -      | -      | 5     | 10          |
| Dart Point Fragment      | -      | -      | -      | -      | -      | 1      | 1      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 3     | 4           |
| Group 1 Biface           | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | 3     | 5           |
| Group 2 Biface           | 1      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | 1      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 4     | 6           |
| Group 3 Biface           | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1     | 5           |
| Burinated Biface         | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1     | 1           |
| Cobble Tool              | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     | 1           |
| Planoconvex Uniface      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | 2      | 5     | 7           |
| Lateral & Distal Retouch | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     | 4           |
| Lateral Retouch          | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 3     | 6           |
| Retouched Flake          | -      | -      | 1      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | -      | 1     | 3           |
| Lateral & Distal Retouch | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 1      | -      | -      | 4     | 8           |
| Lateral Retouch          | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     | 1           |
| Edge-Damaged Flake       | -      | -      | -      | -      | 1      | -      | -      | 1      | -      | -      | 1      | -      | -      | -      | -      | 1      | -      | -      | -      | -      | -      | -      | -      | 4     | 8           |
| Possible Gunflint        | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      | 0     | 1           |
| TOTAL                    | 1      | 1      | 1      | 1      | 3      | 2      | 1      | 1      | 1      | 3      | 2      | 1      | 2      | 1      | 1      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 2      | 32    | 63          |

APPENDIX IV: Sample Forms

J. Peter Thurmond

## INTRODUCTION

The following are samples of the standard forms used by the survey crews in the field for the documentation of recorded archeological sites, survey units, and each day's activity.

PREWITT AND ASSOCIATES, INC., CONSULTING ARCHEOLOGISTS  
SITE SURVEY FORM

State \_\_\_\_\_ County \_\_\_\_\_ Site No. (TARL) \_\_\_\_\_  
Project \_\_\_\_\_ Site Name \_\_\_\_\_ Temp. No. \_\_\_\_\_  
County Map: yes/no USGS MAP \_\_\_\_\_ Tx. No. \_\_\_\_\_  
UTM \_\_\_\_\_ Elevation (MSL) \_\_\_\_\_  
Survey Control Unit \_\_\_\_\_ Informant \_\_\_\_\_  
Owner and Address \_\_\_\_\_  
Location \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Site Type \_\_\_\_\_ Site Size \_\_\_\_\_  
Depth \_\_\_\_\_ Fill \_\_\_\_\_  
Present Condition \_\_\_\_\_  
Description \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Site Age and Components \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Features \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Materials Observed/Collected \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Discussion \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Drainage \_\_\_\_\_ System \_\_\_\_\_

Nearest Water \_\_\_\_\_ Distance \_\_\_\_\_

Soil Type \_\_\_\_\_

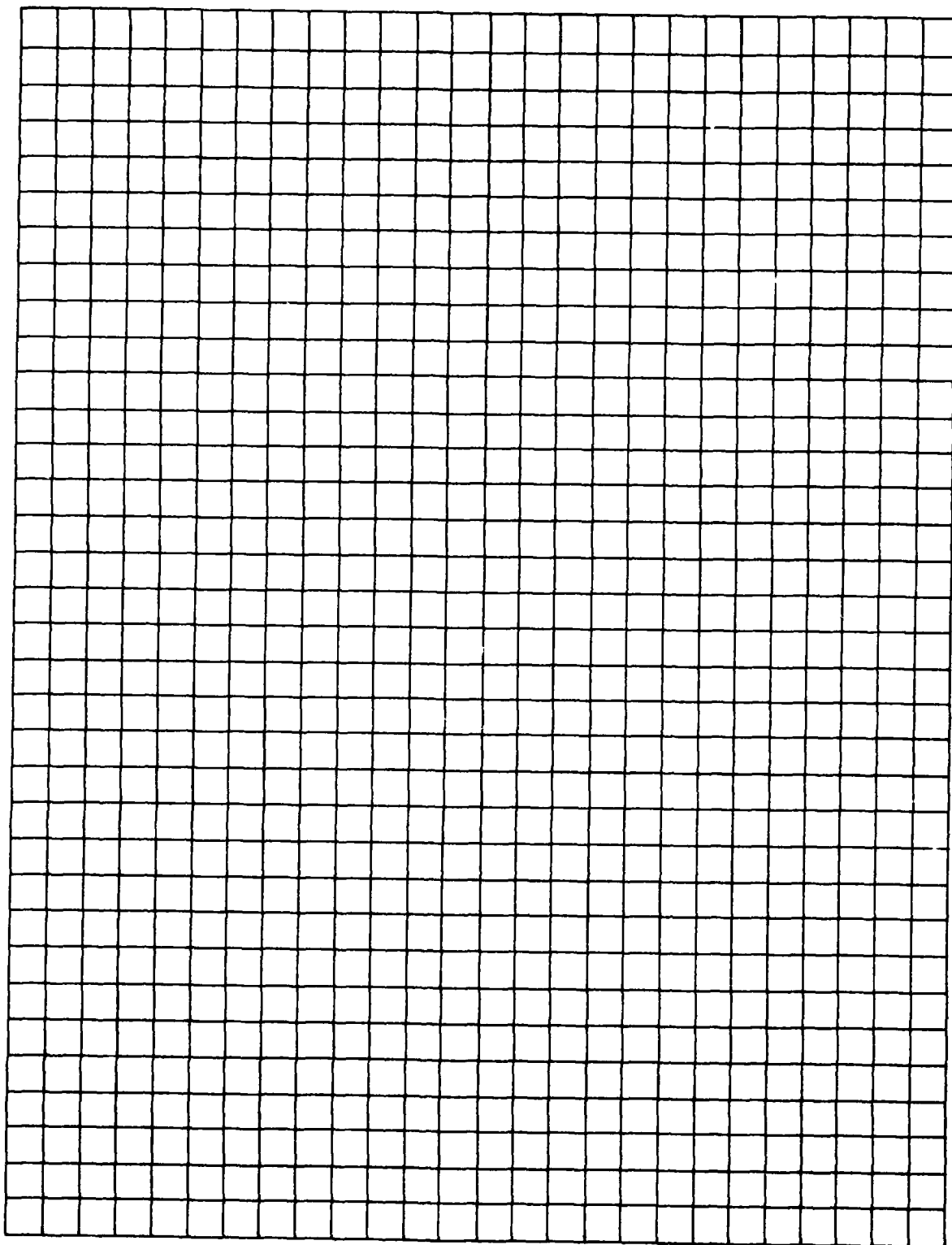
SCS Designation \_\_\_\_\_ Soil Survey Date \_\_\_\_\_

DRAW SKETCH MAP ON REVERSE

SKETCH MAP OF SITE

Page \_\_\_\_ of \_\_\_\_

Project \_\_\_\_\_ Temp. No. \_\_\_\_\_ Site No. (TARL) \_\_\_\_\_





PREWITT AND ASSOCIATES, INC., CONSULTING ARCHEOLOGISTS  
SITE SURVEY FORM (CONTINUED)

Project \_\_\_\_\_ Temp. No. \_\_\_\_\_ Site No. (TARL) \_\_\_\_\_

Physiography \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

Vegetation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Surface Collection \_\_\_\_\_ Test Pits and Type \_\_\_\_\_

Samples Collected \_\_\_\_\_

\_\_\_\_\_

Photographs \_\_\_\_\_

\_\_\_\_\_

Information Yield Potential Assessment \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Recommendations (Justify) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

National Register Assessment \_\_\_\_\_

\_\_\_\_\_

State Archeological Landmark ? \_\_\_\_\_ Agency \_\_\_\_\_

Disposition of Records \_\_\_\_\_ Artifacts \_\_\_\_\_

Recorded by \_\_\_\_\_ Date \_\_\_\_\_

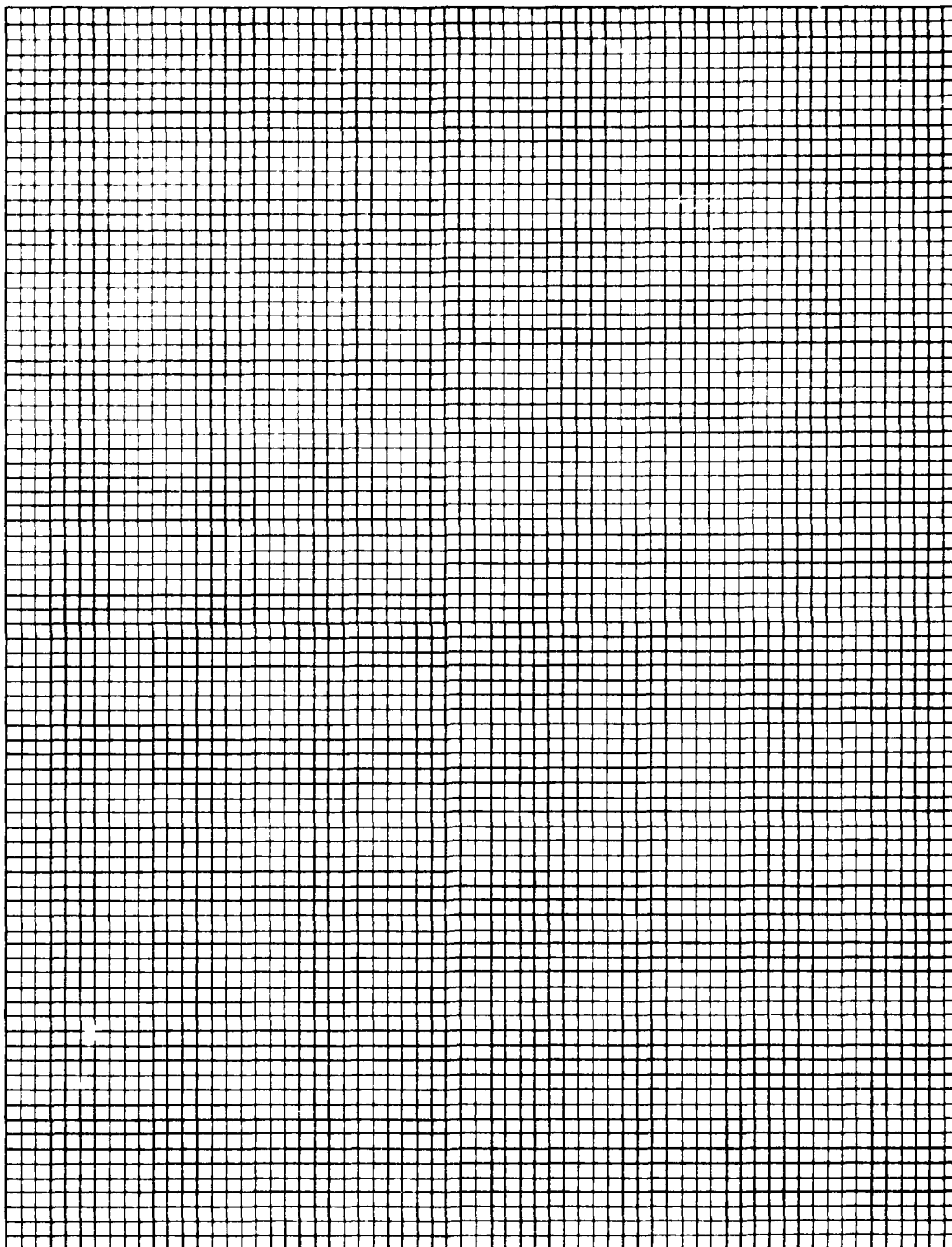
Affiliation \_\_\_\_\_

DRAW ARTIFACTS AND CONTINUE COMMENTS ON REVERSE

ARTIFACT DRAWINGS and ADDITIONAL COMMENTS

Page \_\_\_\_ of \_\_\_\_

Project \_\_\_\_\_ Temp. No. \_\_\_\_\_ Site No. (TARL) \_\_\_\_\_



BRAZOS SALT POLLUTION PROJECT

SURVEY UNIT RECORD FORM

SU Designation \_\_\_\_\_ USGS Map Reference \_\_\_\_\_

Crew \_\_\_\_\_

Effective Acreage/Mileage \_\_\_\_\_

Brief Summary of Location \_\_\_\_\_

\_\_\_\_\_

Owner/Lessee \_\_\_\_\_

Physiography \_\_\_\_\_

\_\_\_\_\_

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Vegetation \_\_\_\_\_

\_\_\_\_\_

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Summary of Recorded Sites \_\_\_\_\_

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Summary of Recorded Localities \_\_\_\_\_

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Assessment and Interpretation \_\_\_\_\_

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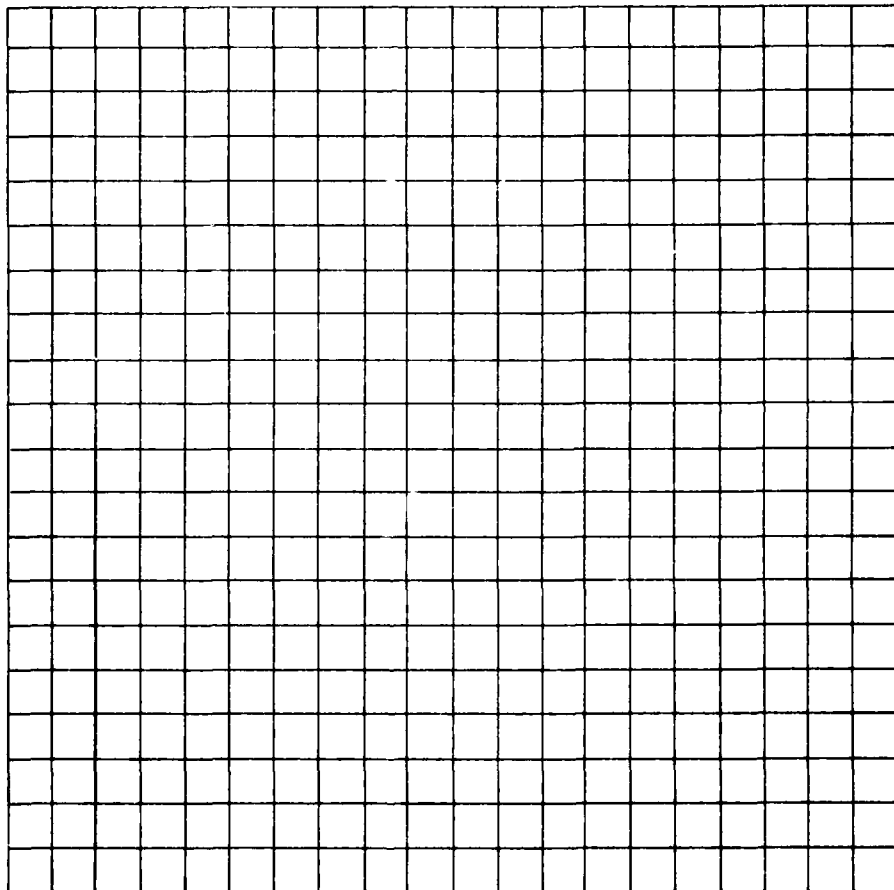
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Recorder \_\_\_\_\_ Date \_\_\_\_\_

## SKETCH MAP OF SURVEY UNIT

Map drainages, topography, general distribution of vegetation assemblages; plot locations of recorded sites and localities; and any relevant modern cultural features.

↑  
N



Scale: 1 inch = 100 meters

BRAZOS SALT POLLUTION PROJECT

CREW CHIEF REPORT

Date \_\_\_\_\_ Crew \_\_\_\_\_ Crew Chief \_\_\_\_\_

Survey units covered and acreage of each \_\_\_\_\_

\_\_\_\_\_

General location of Survey Units \_\_\_\_\_

\_\_\_\_\_

Ownership of SU's surveyed \_\_\_\_\_

\_\_\_\_\_

Total acreage surveyed by crew this day \_\_\_\_\_

Sites recorded (state SU location and summarize character) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Localities recorded (state SU location and summarize character) \_\_\_\_\_

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General character of today's survey area \_\_\_\_\_

\_\_\_\_\_

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Problems encountered \_\_\_\_\_

\_\_\_\_\_

Additional supplies and/or equipment needed and when \_\_\_\_\_

\_\_\_\_\_

Total acreage surveyed by this crew to date \_\_\_\_\_

Crew composition this day \_\_\_\_\_

Additional remarks \_\_\_\_\_

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APPENDIX V: Geology of the Brazos Natural Salt  
Pollution Control Project Area

Vance T. Holliday

## INTRODUCTION

Geologic consultation was provided Prewitt and Associates, Inc. for five field days in June 1981 as part of an archeological reconnaissance of certain tributaries of the upper Brazos River. The geologic investigations were concerned with those aspects of the geology of the project area pertinent to the cultural history; these include a regional examination of the bedrock stratigraphy, assessment of regional and local landscape development, a general reconstruction of regional and local Quaternary geology, and an assessment of types, origins, and availability of material suitable for stone tool manufacture.

The geologic investigations were carried out by means of field examinations within the individual survey areas (Dam Sites 10, 14 and 19) and included specific archeological sites. Due to time constraints, only selected areas within each reservoir were examined. Selection of these areas was dependent on ease of access and the significance of exposures or other geologic features within a given area with respect to the Quaternary geologic and/or cultural history of the area. A general field reconnaissance of areas surrounding each reservoir was also conducted. Interpretations of the geology were aided by available soil surveys, topographic maps, and airphotos. In addition, the author's continuing research into rates of soil formation in the Lubbock, Texas area (200 kilometers west of the project area) aided in assessing soil development and the age of Quaternary sediments in the project area. All available literature on the geology of the region was reviewed.

In the following report a general review of the geologic setting, which includes a discussion of available lithic tool resources, is presented first and is followed by a discussion of the geology of the individual reservoir areas.

## REGIONAL GEOLOGIC SETTING

The project area is located within the southwestern portion of the Osage Plains Section of the Central Lowland physiographic province and is approximately 100 kilometers east of the Llano Estacado region of the High Plains section, Great Plains province (Hunt 1967). Hydrologically, the area is within the upper Brazos River drainage basin; Dam Sites 10 and 14 are within the Salt Fork drainage (major subdivision 21 of the Brazos River; Cronin and Follett 1963:Plate 2), and Dam Site 19 is within the mainstem Brazos River drainage (major subdivision 22 of the Brazos River; Cronin and Follett 1963:Plate 2).

The bedrock stratigraphy of the project area has been reviewed by a number of investigators (e.g., Patton 1930; Reeves 1971; Cronin and Follett 1963; Barnes 1967), and there is some variation in terminology of individual formations in the area (Table 34). The terminology used here is that of Barnes (1967) which represents the most comprehensive and recent geologic map of the area.

TABLE 34  
CORRELATION OF TERMINOLOGY FOR BEDROCK STRATIGRAPHIC  
UNITS IN THE BRAZOS NATURAL SALT POLLUTION  
CONTROL PROJECT AREA

| Barnes 1967;<br>Reeves 1971                                | Cronin and Follett 1963 | Patton 1930                                 |
|--|-------------------------|---|
| Whitehorse/Cloud<br>Chief Group                            | Whitehorse Formation    | Peacock Formation                           |
| Blaine Formation<br>San Angelo Formation;<br>El Reno Group | Pease River Group       | Blaine Formation<br>San Angelo<br>Formation |
| Choza Formation;<br>Clear Fork Group                       | Clear Fork Group        | Clear Fork<br>Formation                     |

The bedrock formations within the area are composed of Permian "red beds" and include, from oldest to youngest, the Choza Formation of the Clear Fork Group, the San Angelo and Blaine formations of the El Reno Group, and the Whitehorse/Cloud Chief Group (for convenience, the latter is referred to simply as the Whitehorse Group). These units crop out in roughly parallel north-south-trending exposures across the project area (Fig. 18); they decrease in age from east to west. These units are very generally similar in that they are composed of conglomerate, sandstone, shale, dolomite and gypsum; however, there are considerable variations in the thickness, degree of cementation, and presence or absence of the various lithologies listed which make each unit distinctive. The differences between the units are reflected by significant variations in the landscapes which have developed on the respective units.

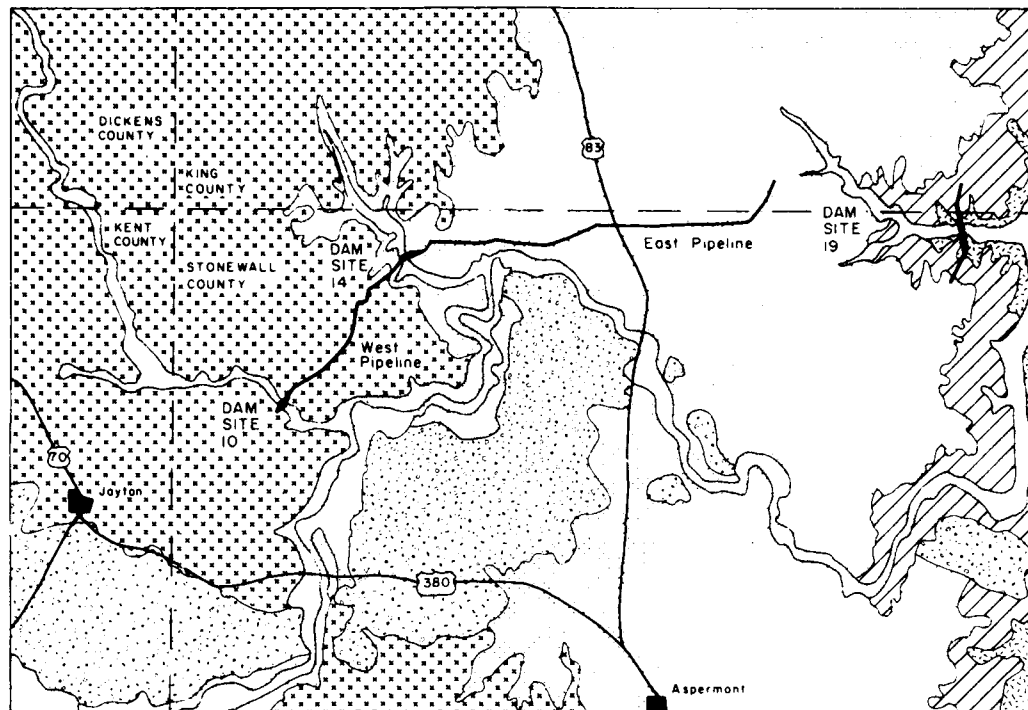
Within the project area, the Choza Formation consists of interbedded shales and sandstones. The shales, which are the dominant lithology, are sandy and alternately red and bluish green; the gray, fine-grained quartz sandstone is massive and moderately indurated. In southeastern Stonewall County, the uppermost unit of the Choza Formation is a massive dolomite (Merkel Dolomite); however, in the Dam Site 19 area the dolomite is absent and a gray sandstone in the same stratigraphic position appears to be a facies of the dolomite in this area.

The shaly section of the Choza Formation is easily eroded and forms broad valleys. The dolomite and its sandstone facies, however, are quite resistant and form a prominent escarpment in the area. Only the upper 30 meters of the Choza is exposed in or near the project area (Barnes 1967; Patton 1930:15-20).



Figure 18

# BRAZOS NATURAL SALT POLLUTION PROJECT KENT, KING & STONEWALL COUNTIES, TEXAS OUTCROP LITHOLOGY



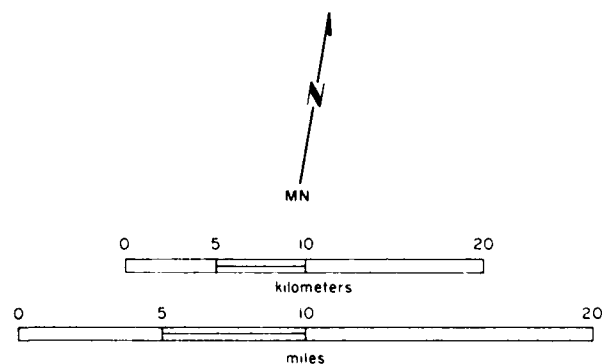
## LEGEND

### QUATERNARY DEPOSITS

- Alluvium
- Eolian Sand

### PERMIAN UNITS

- Whitehorse Group
- Blaine Formation
- San Angelo Formation
- Choza Formation



The San Angelo Formation within the project area is predominantly a red (sometimes gray), fine-grained quartz sandstone and also contains red to bluish gray shales and conglomerates of dolomitic and siliceous limestone pebbles. The formation ranges from 15 to 40 meters in thickness (Barnes 1967; Patton 1930:21-24).

The landscape of areas where the San Angelo Formation crops out are usually open, level to gently rolling plains. In those areas where the unit contains indurated sandstone or thick conglomerate which are sufficiently resistant to form cliffs and steep-walled valleys, escarpments will occasionally interrupt the otherwise horizontal landscape.

The Blaine Formation, which is quite variable in lithology, contains shales in various shades of red or gray; moderately indurated, red, silty, fine-grained quartz sandstone; white or bluish gray to pink, contorted gypsum beds; and dolomite in various shades of gray, pink and white. Some of the dolomite beds are of sufficient thickness and areal extent to be mapped separately (e.g., Barnes 1967). The lower 30 to 50 meters of the unit, which averages 220 meters in total thickness, are dominated by shales with interbedded gypsum, sandstone and dolomite. Up-section the gypsum beds increase both in frequency (occupying one-third to one-half of the section) and in thickness (up to 10 meters). Many of the gypsum beds are discontinuous and vary considerably in thickness from one outcrop to another (Barnes 1967; Patton 1930:24-45).

Most of the beds in the Blaine Formation, in particular gypsum and dolomite, are relatively resistant to erosion and result in rugged topography in areas of Blaine outcrops. Numerous deep canyons, steep cliffs, buttes, mesas and spires are characteristic.

The Whitehorse Group (Peacock Formation of Patton 1930), which averages 200 meters in thickness, is primarily a red, fine-grained, weakly consolidated, silty sandstone with some streaks of gray. The unit also contains occasional interbeds of red shale, gypsum and dolomite. For the most part, however, the Whitehorse Group is the most homogeneous in color and lithology of any unit in the area (Barnes 1967; Patton 1930:45-52).

The general uniform lithology and friable nature of the Whitehorse Group results in gently rolling topography with relatively wide shallow valleys in most areas where the unit is exposed at the surface. The principal exceptions are those areas where the thicker gypsum and dolomite beds crop out, and these more resistant beds form canyons and cliffs.

Structurally, the survey area is dominated by a westward-dipping monocline which is the result of Permian deposition on the eastern flank of the Midland or "Permian" basin. The beds, therefore, have a regional westward dip with rocks in the eastern part of Stonewall County having a steeper dip than those in the western portion. The average regional dip is 27° N (approximately 28 ft/mile) (Patton 1930:54; Reeves 1971:A-12). No faults or regional joint systems have been observed in the project area; however, channel patterns suggest some control by either jointing

or faults. Some local jointing is apparent in the gypsum beds which are often warped, folded or otherwise contorted and affect overlying beds. This is undoubtedly the result of solution and/or reprecipitation of the salts. Broader regional structural control is also suggested by the channel patterns of the Salt Fork and Double Mountain Fork of the Brazos River (Reeves 1971:A-12).

All of the geologic units in the survey area are subject to erosion and most units, or at least considerable portions of these units, are prone to dissection and the development of "badlands" topography. Even the relatively competent beds such as the gypsum and dolomites collapse as underlying less resistant beds are eroded. Heavy erosion, which appears to be a problem in all areas investigated, is probably due to poor grazing practices in Historic times. However, given the nature of the units and the presence of at least some flowing water (either from springs or run-off), erosion has probably occurred over a longer period of time. Erosion has undoubtedly had an adverse effect on the archeological sites, many of which have certainly been destroyed as rock ledges collapse or gullies form. Other sites have apparently been scattered through the effects of gullying and sheetwash on incompetent beds.

The Quaternary geologic history of the survey area has been dominated by the development and incision of the Brazos River and its various forks and tributaries. Erosion within the area is generally directly or indirectly related to alluvial activity within the Brazos River drainage.

Relatively little work has been done concerning the history of the upper Brazos River and virtually no work has been carried out on the Salt Fork or its tributaries within the survey area. A few general statements, however, can be made concerning the river and its history as it pertains to the project area. Epps (1973) believes, on the basis of quantitative geomorphic analysis and the distribution and lithology of gravels and terraces, that the Brazos River was established by at least Miocene times and possibly earlier. The "ancestral Brazos River" (age of this not given) appears to have had bankfull discharge five to nine times greater than that of the present river; this suggests a bankfull width of 800 meters and bankfull depth of over 15 meters. Epps has identified three general terraces (hence, former floodplains) at 48 meters, 14 to 18 meters, and about 9 meters above the modern floodplain in the project area. Judging from the soils developed on the terraces and their position and lithology, the oldest (highest) terrace may be early Pleistocene and the youngest (lowest) terrace may be late Pleistocene (Wisconsin?) in age. There are suggestions of even older, higher terraces (gravels) in the area.

The modern Salt Fork of the Brazos River is a wide "decidedly underfit" (Reeves 1971:A-10) meandering stream with associated extensive sand and gravel deposits. Prior to the present investigation, no studies of the alluvial history of the tributaries have been reported. Nevertheless, some general comments can be made concerning the terrace systems and modern drainage channels of the three pertinent tributaries which are discussed below. Each tributary exhibits terraces at roughly

the same heights as the two lower terraces of the Brazos River described by Epps (1973). However, on the basis of the degree of soil development on these terraces, there is considerable variation in the ages of the terraces between tributaries, especially the lower terraces. This is not surprising inasmuch as fluvial systems are extremely complex and sensitive to subtle, minor, local variations in bedrock competence, size of drainage, and environmental change. Any of these factors can have a considerable effect on cut and fill cycles, and for these reasons no attempt is made to correlate terraces between drainages.

On Barnes' (1967) 1:250 000-scale geologic map of the area, extensive deposits of Quaternary sands are shown roughly following the courses of the Salt Fork and its major tributaries (Fig. 18). Reeves (1971:A-10) considers these sediments to be derived from floodplains by way of eolian processes, and this is undoubtedly the case. The deposits are only found along the river, and usually only on the downwind (eastern) side of the channel where reaches are roughly perpendicular to the prevailing wind direction (south to southwest). Only the thicker, more conspicuous deposits of eolian material are mapped; otherwise, bedrock is shown at the surface. During the course of the fieldwork reported here, it became apparent that the surface of much of the survey area, particularly the less heavily dissected uplands in the vicinity of Dam Sites 10 and 14, is covered by a mantle of thin (less than 1 meter) fine sand to silt. A well-developed soil (A/cambic B/Cca) suggests that the material is relatively old (early Holocene?) and is a downwind, finer-grained, loesslike facies of the coarser dune sands mapped by Barnes. The areas covered by this material, although often outside the areas subjected to archeological survey, could contain sites of respectable antiquity at or very near the surface.

#### LITHIC RESOURCES

The primary sources of materials suitable for stone tool manufacture are the gravel deposits of the Salt Fork of the Brazos and its larger tributaries, including those involved in this project. The gravels are generally composed of metaquartzites of a variety of colors (white, shades of gray, purple) and textures (usually fine- to medium-grained). Cherts, flints and jaspers which occasionally occur within the gravel deposits are quite similar to materials noted within the Ogallala Formation located to the west of the project area. In fact, it seems very likely that these materials derive from that formation because the Brazos drainage heads in areas of Ogallala outcrops. The Ogallala at one time probably extended into the survey area, and there are no other known sources from which to derive the metaquartzites (Epps 1973; Holliday and Welty 1981). The gravels are quite suitable for tool manufacture if they are of adequate size, and were apparently a source of lithic material on the Llano Estacado (Holliday and Welty 1981).

Other materials which can be utilized for toolmaking are also available in the region, and artifacts noted within the project area demonstrate that they were utilized. The well-known Alibates agate

occurs north of Amarillo at a distance of approximately 300 kilometers northwest of the study area. A similar material, Quitaque or Tecovas jasper, occurs within the northeastern portion of the Llano Estacado in the Quitaque area about 160 kilometers to the northwest. Cherts of varying, although usually high, quality are found in the Edwards Formation and are available near Gail within the southeastern portion of the Llano Estacado and in the Sterling City-San Angelo area 160 kilometers west-southwest and south-southwest, respectively, of the project area. The Seymour gravels, an extensive deposit of Quaternary fluvial sediments which occurs immediately east of the project area, is usually the source of excellent raw materials, including the gray-green Potter "chert," also known as Ogallala quartzite, which is a silica-cemented siltstone. The Seymour gravels were apparently derived from the Potter Formation that comprises a basal gravel in the Ogallala Formation which is exposed within the northeastern portion of the Llano Estacado (Holli-day and Welty 1981; Hood 1978; Epps 1973).

#### DAM SITE 10

Dam Site 10, which is located on Croton Creek, is situated entirely on the Whitehorse Group. Gypsum beds of the lower Whitehorse crop out along valley walls in the eastern portion of the reservoir area. According to Reeves (1971:A-5):

Two salt flats with associated saline seeps and springs exist in the western part of the impoundment site, one along Hot Springs Canyon about 3 miles south of the Dickens County line and another near the head of Short Croton Creek.

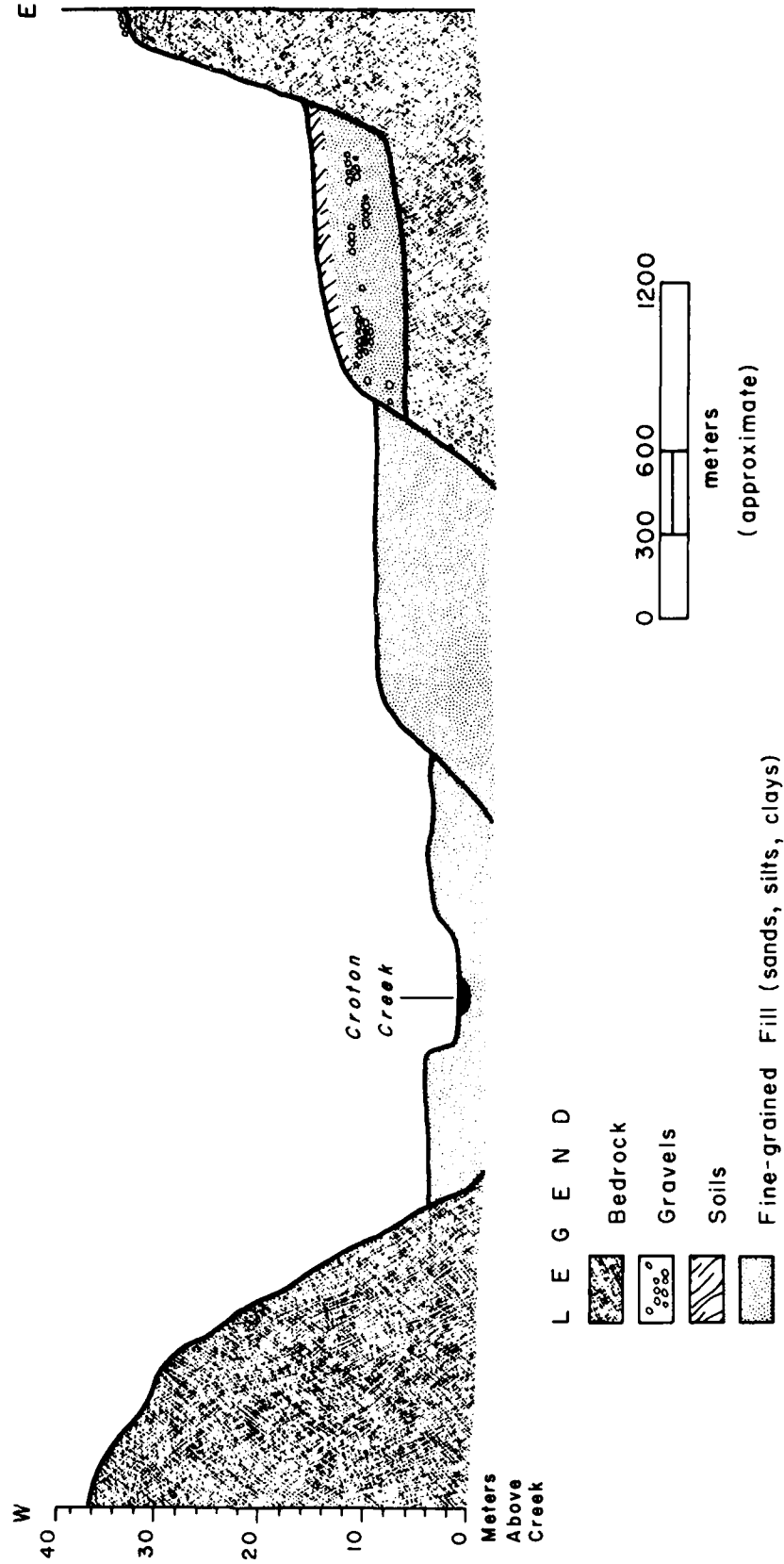
The landscape in the Dam Site 10 area is predominantly gently rolling although near the eastern end of the reservoir area, where the most resistant gypsum beds crop out, the creek becomes entrenched and has steep valley walls and deeply cut tributaries. The essentially uniform texture, color and friable nature of the Whitehorse Group renders difficult the differentiation of reworked sediments (alluvial deposits) from weathered or poorly consolidated bedrock, particularly on the uplands away from the creekbed. The presence of gravels within a unit is often the only means of detecting alluvium. Probably as a result of the uniform, easily erodable nature of the bedrock, the creeks in this area have broad valleys with shallowly sloping valley walls.

The linear north-northwest to south-southeast trend of Croton Creek between the Dickens County line and the mouth of Short Croton Creek is an example of the structurally controlled valleys discussed previously.

An examination of cuts in the vicinity of Survey Unit A-10 immediately southeast of Survey Unit A-23 and just downstream from Survey Unit B-17 (Short Croton) yielded evidence of at least four cycles of alluviation (Figs. 19 and 20).

Figure 19

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 10 GENERALIZED ALLUVIAL STRATIGRAPHY ALONG CROTON CREEK



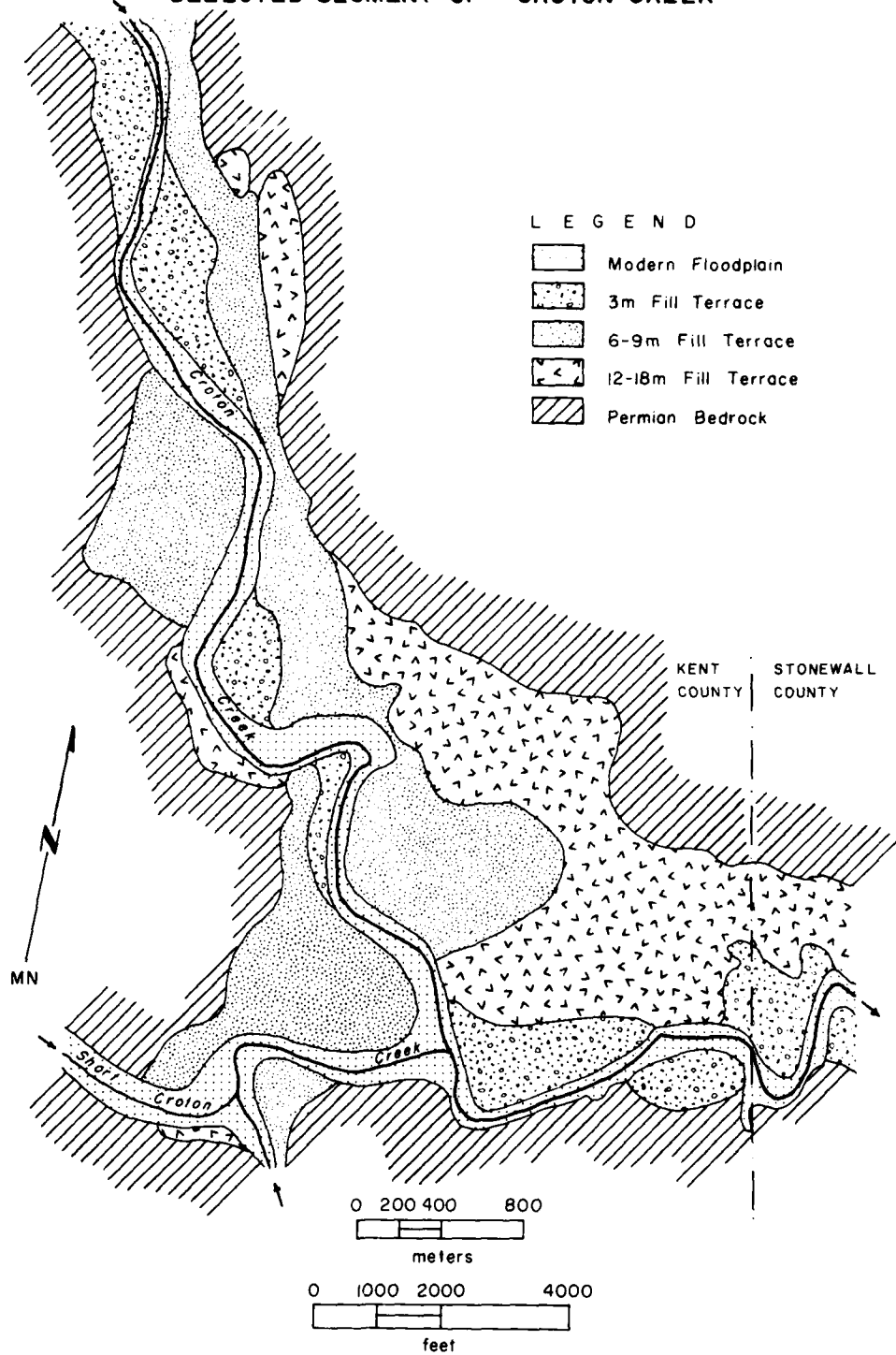
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Figure 20

# BRAZOS NATURAL SALT POLLUTION PROJECT

## DAM SITE 10

### DISTRIBUTION OF ALLUVIAL DEPOSITS ALONG A SELECTED SEGMENT OF CROTON CREEK



At approximately 21 to 24 meters above the floor of Croton Creek near the eastern end of the reservoir area, an extensive gravel-capped strath terrace is apparent. The gravels are up to 20 centimeters in diameter and occur over a considerable area. Lag concentrations of these gravels along the northern valley margin were recorded as sites 41SN55 and 41SN56 and localities L41SN35 and L41SN40 (Appendices I and II, Fig. 9).

The next highest terrace is between 12 and 18 meters above Croton Creek and is best expressed and preserved near the confluence of that stream with Short Croton Creek (Fig. 19). The deposits consist of silty fine-sands up to 1 meter in thickness which, in some exposures, overlie localized channel gravels (c.f., locality L41KT7, Appendix II). The soil formed in this alluvium is moderately well developed and consists of a cambic B horizon with strong prismatic structure over a zone of secondary calcium carbonate ( $\text{CaCO}_3$ ) accumulation which usually qualifies as a calcic horizon. On the basis of this soil development, the sediments may be mid to early Holocene in age, and archeological materials could be expected on or within these sediments.

Between 6 and 9 meters above Croton Creek is a fill terrace composed of thinly bedded fine-sands, silty fine-sands, and silts. Bedding is apparent to the surface of the deposit with no appreciable soil development, and these sediments appear to be typical overbank floodplain deposits which have been accreting up to essentially modern times. In view of this there are probably no aboriginal archeological remains on or near the surface of this terrace.

The youngest alluvial deposits are less than 3 meters above the creek and include modern floodplain sediments and a low fill terrace. The terrace consists of thicker accumulations of modern floodplain materials cut by the creek as it meanders; these are the most recent deposits of Croton Creek and are probably considerably less than 100 years old.

Most alluvial deposits along Croton Creek are of quite recent origin and are the result of modern floodplain accretion. No significant Holocene terrace deposits were observed along Short Croton Creek other than a few small remnants of deposits similar in position and soil development to those of the 12-to-18-meter terrace on Croton Creek. It was not possible to examine exposures along Salt Creek, but judging from the soil survey of the area (Goerdel and Watson 1975), the sediments are quite recent.

#### DAM SITE 14

Dam Site 14, which is located along Salt Croton Creek, covers the uppermost Blaine Formation outcrop and is surrounded by an outcrop of the lower Whitehorse Group. As a result of the presence of these relatively resistant units, the area has deeply entrenched canyons and constricted stream valleys. The narrowness of the valleys has resulted in



the removal of most of the archeologically significant alluvial deposits (i.e., those deposits less than about 12,000 years old but older than the modern alluvium).

Field investigation was concentrated along Salt Croton Creek near the mouth of Dove Creek (Survey Units A-65 and B-64), along Southerland Canyon north of Survey Unit B-63, and west of Southerland Canyon in and north of Survey Unit A-76.

Three alluvial deposits were observed along Salt Croton Creek (Figs. 21 and 22). The highest and oldest deposits, which are over 12 meters above the creek floor, consist of extensive gravel deposits that are several meters thick and rest on bedrock (i.e., a strath terrace). This terrace is most common along the north side of Salt Croton and is often several hundred meters wide; a particularly well-preserved portion of this terrace is located just west of lower Southerland Canyon (Fig. 23; see also site 41SN42, Appendix I, and locality L41SN26, Appendix II). The extent, coarseness, and heavily eroded nature of this deposit suggests that it dates at least to the late Pleistocene (Wisconsin?).

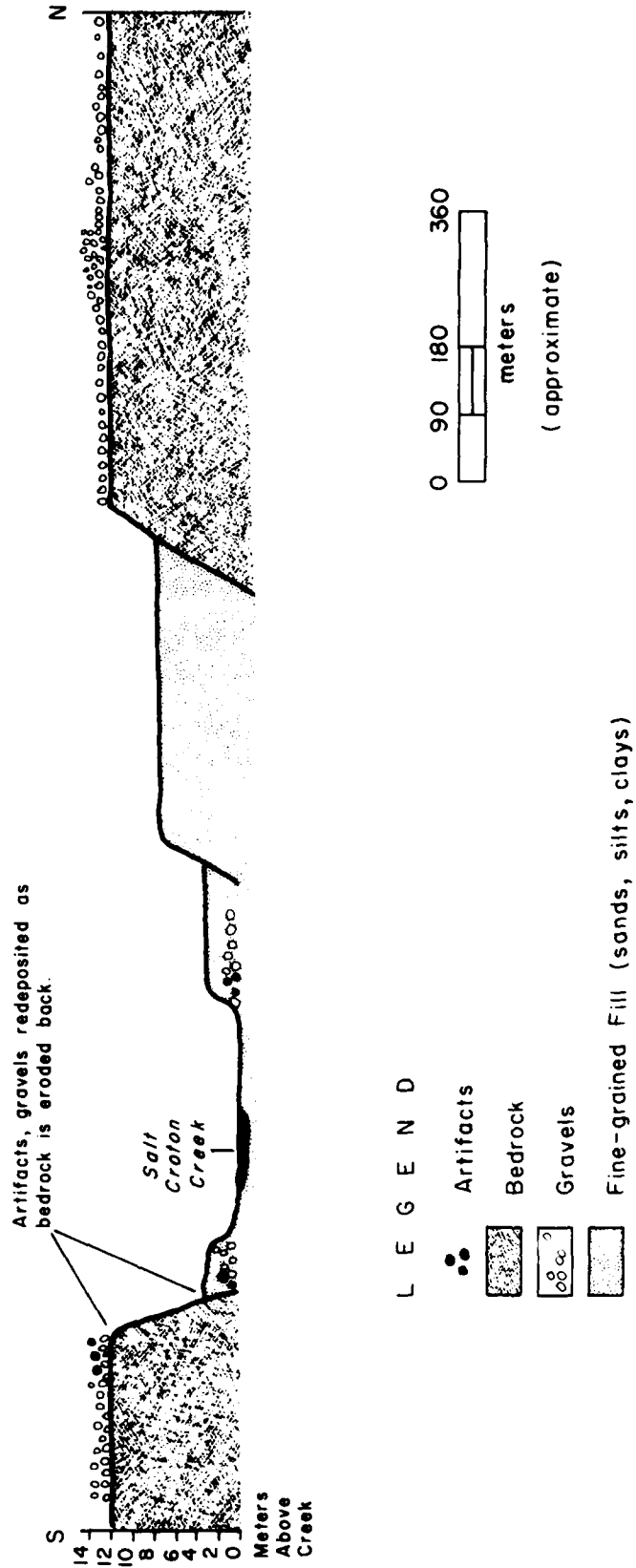
Between 6 and 9 meters above Salt Croton Creek is an extensive deposit of thinly bedded, silty fine-sands which represent overbank floodplain deposits. Relatively weak soil development (A/structural B horizon) suggests that the unit has been in place less than 1,000 years and was probably deposited within the last few hundred years.

The youngest deposits along Salt Croton Creek are modern floodplain sediments and a low fill terrace between 1 and 3 meters above the streambed. These materials are essentially identical in origin and age to those found in similar position in Dam Site 10. Exposures of this modern alluvium contain occasional pockets of gravels which often include archeological materials (c.f., sites 41KG50 and 41SN40, Appendix I). The apparent recent age of the deposits and mixture of artifacts with typical gravels indicates that both the artifacts and unaltered gravels are redeposited. Archeological sites in the area are frequently located on the highest terrace (the 12-meter strath terrace) on top of the gravels. The underlying bedrock is easily eroded, and as the gravels and archeological sites are undercut, these materials become entrained in the modern creek below. The artifacts usually exhibit no evidence of stream-rolling; this indicates that they and the gravels have not traveled far, perhaps a few hundred meters at most.

Several other alluvial units were noted along Southerland Canyon (Fig. 23). North of the reservoir area, arroyo cuts in valley fills revealed several spectacular sections of older alluvium inset against the Permian red beds (Fig. 23; see also locality L41KG14, Appendix II). Only the youngest of these deposits was accessible for examination; it consists of over 6 meters of silty fine-sand with occasional gravel lenses near the base. A well-developed soil (A/cambic [argillic?] B with strong prismatic structure/calclitic horizon over 1 meter thick) has formed in these sediments and indicates they are early to mid Holocene in age. The higher deposits observed in the arroyo cuts are probably at least late Pleistocene in age. The younger Southerland Canyon valley

Figure 21

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 14 GENERALIZED ALLUVIAL STRATIGRAPHY ALONG SALT CROTON CREEK



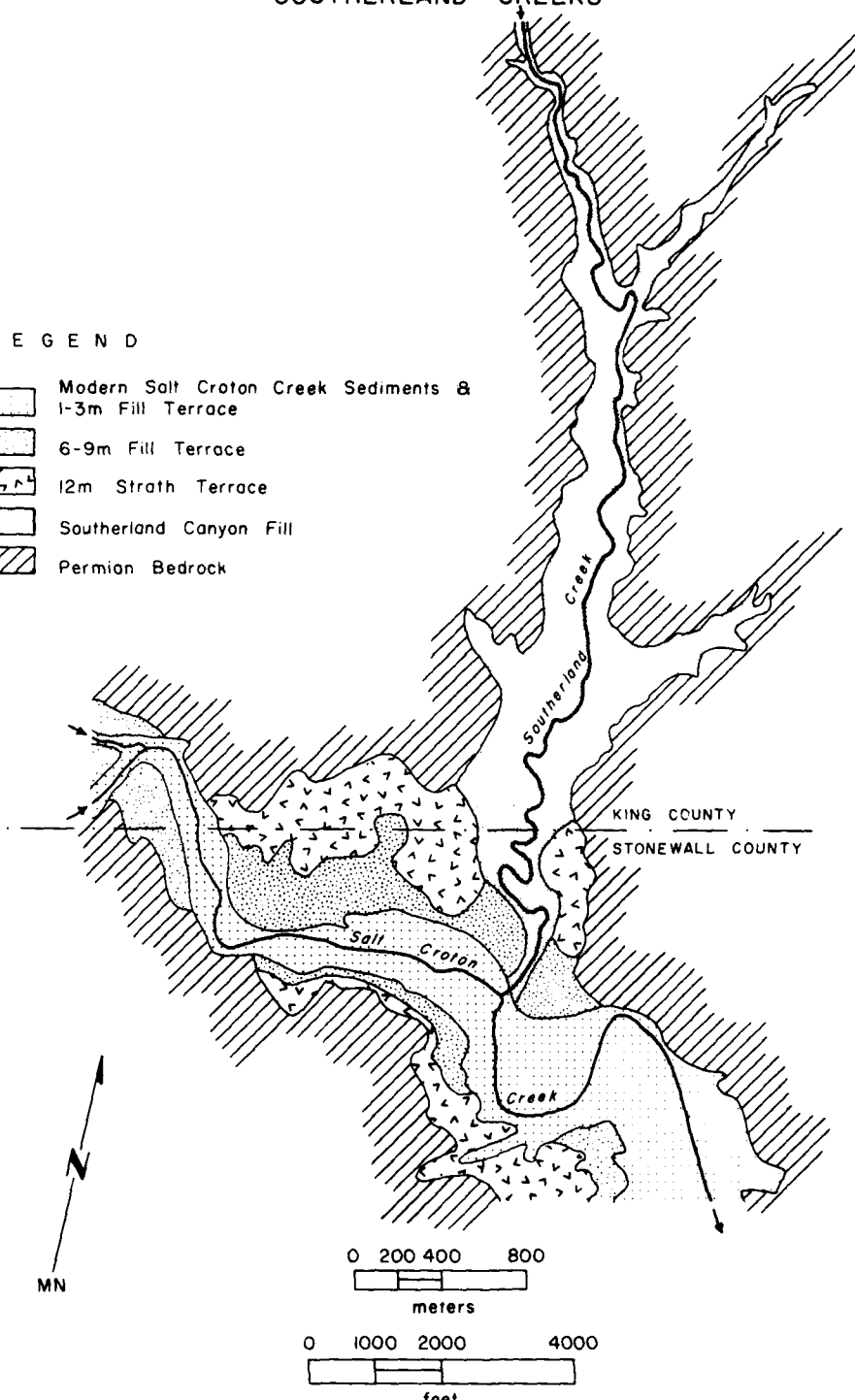
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# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 14

DISTRIBUTION OF ALLUVIAL DEPOSITS ALONG  
SELECTED SEGMENTS OF SALT CROTON AND  
SOUTHERLAND CREEKS

## LEGEND

-  Modern Salt Croton Creek Sediments & 1-3m Fill Terrace
-  6-9m Fill Terrace
-  12m Strath Terrace
-  Southerland Canyon Fill
-  Permian Bedrock

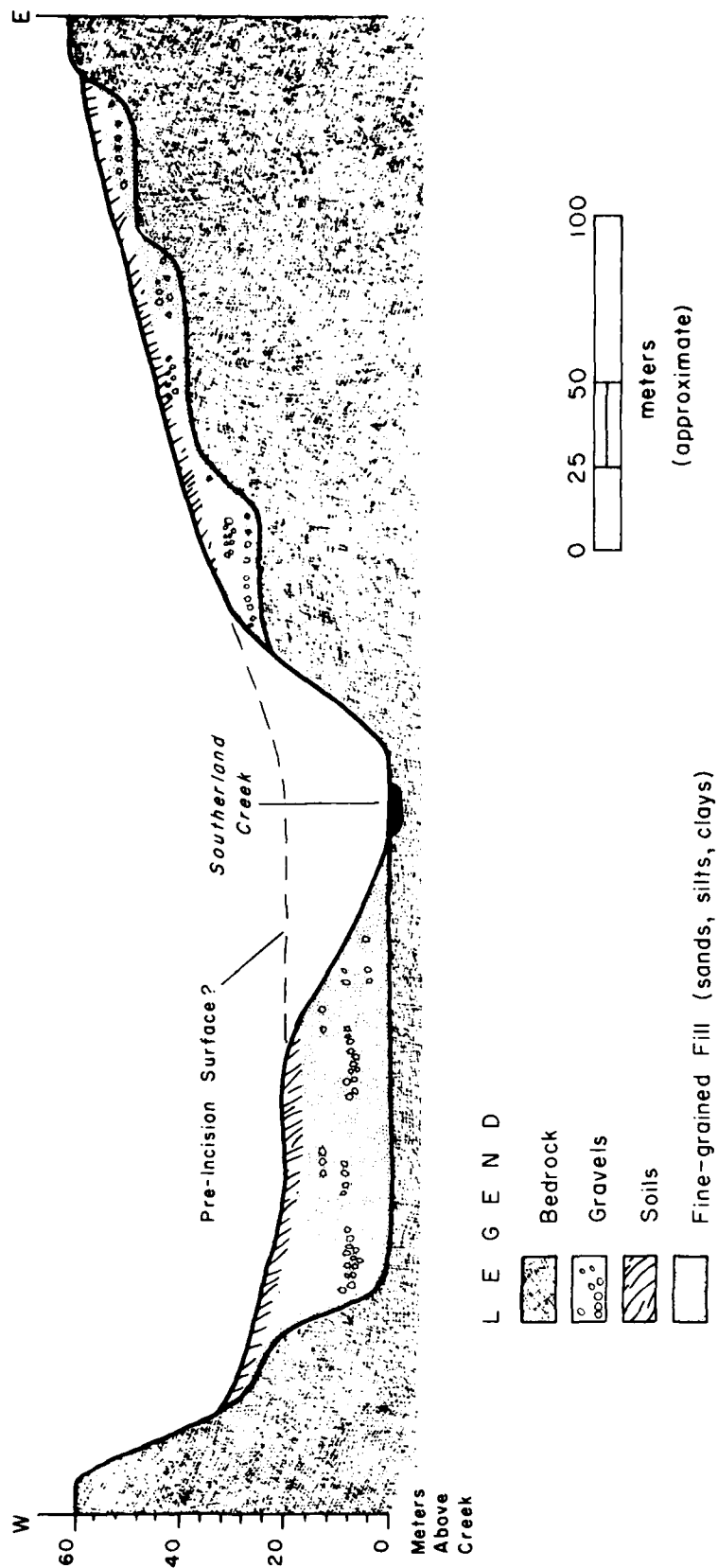


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Adapted From: USGS, Southerland Canyon, Texas, 75' Sheet, 1958

Figure 23

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 14 GENERALIZED ALLUVIAL STRATIGRAPHY ALONG SOUTHERLAND CANYON



PAAI/81/SHP

fill (with the well-developed soil) is traceable for approximately 3 kilometers along the valley floor; this deposit could contain archeological sites.

#### DAM SITE 19

Dam Site 19 is on North Croton Creek which is a tributary of the Salt Fork of the Brazos River above its confluence with Double Mountain Fork. The reservoir area crosses three geological formations; the upper Choza along the valley floors near the eastern end of the impoundment area; the entire San Angelo section throughout most of the reservoir area; and the lowermost Blaine at the northwestern end of the reservoir on North Croton Creek, Pen Branch and the southwestern end on Wedington Creek.

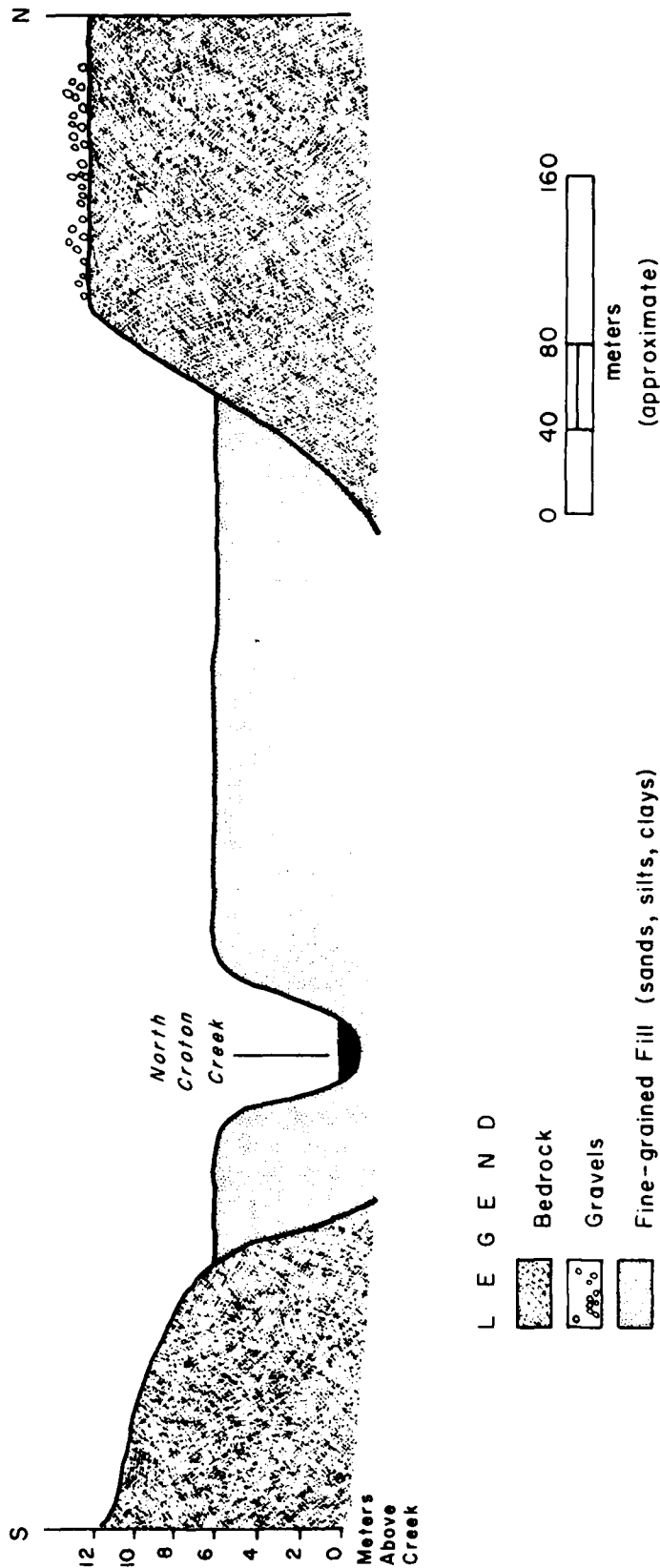
Because of the variety of geologic formations which are exposed in the area, there is considerable variation in topography. The easily eroded Choza Formation forms flat broad valley bottoms. The Choza-San Angelo contact is marked by an escarpment approximately 18 meters high which forms relatively deep canyons. Other resistant units within the San Angelo Formation form a series of "steps" as one moves westward and exhibit broad flats which are formed on the less resistant beds between escarpments. The San Angelo-Blaine Formation contact is also marked by an 18-meter escarpment. The lower Blaine Formation has numerous resistant units, and the western end of the reservoir area has some of the most rugged terrain of the three reservoirs expressed as deep narrow canyons and considerable relief.

Field investigations in the Dam Site 19 area included a reconnaissance along the upper (northwestern) end of the reservoir, an examination of Survey Units A-132, A-169, A-171, and the area between the latter two, Survey Units A-191 and A-199, and a reconnaissance along the southern side of North Croton Creek between Survey Unit A-171 and the dam axis.

The alluvial record of Dam Site 19 is similar to that of Dam Site 14 (Figs. 24 and 25). At about 12 to 15 meters above the creek is an extensive gravel-capped strath terrace which is most conspicuous along the northern side of the valley (c.f., localities L41KG5, L41KG7, L41KG21, L41SN2, L41SN23, L41SN31, Appendix II). In some exposures the gravels are up to several meters in thickness, and in these areas the upper half of the section exhibits a calcrete (i.e., a zone of massive, indurated, secondary  $\text{CaCO}_3$ ; a Ccam or petrocalcic horizon). The calcrete would be Stage III-IV in the carbonate accumulation scheme of Gile, Peterson and Grossman (1966) and Stage IV of Bachman and Machette (1977). Such an accumulation of carbonate indicates that the gravels must have been part of a soil profile (the overlying solum having been eroded) that existed for a considerable period of time (at least since the late Pleistocene).

Figure 24

**BRAZOS NATURAL SALT POLLUTION PROJECT**  
**DAM SITE 19**  
**GENERALIZED ALLUVIAL STRATIGRAPHY ALONG NORTH CROTON CREEK**

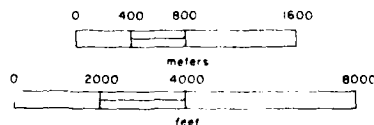
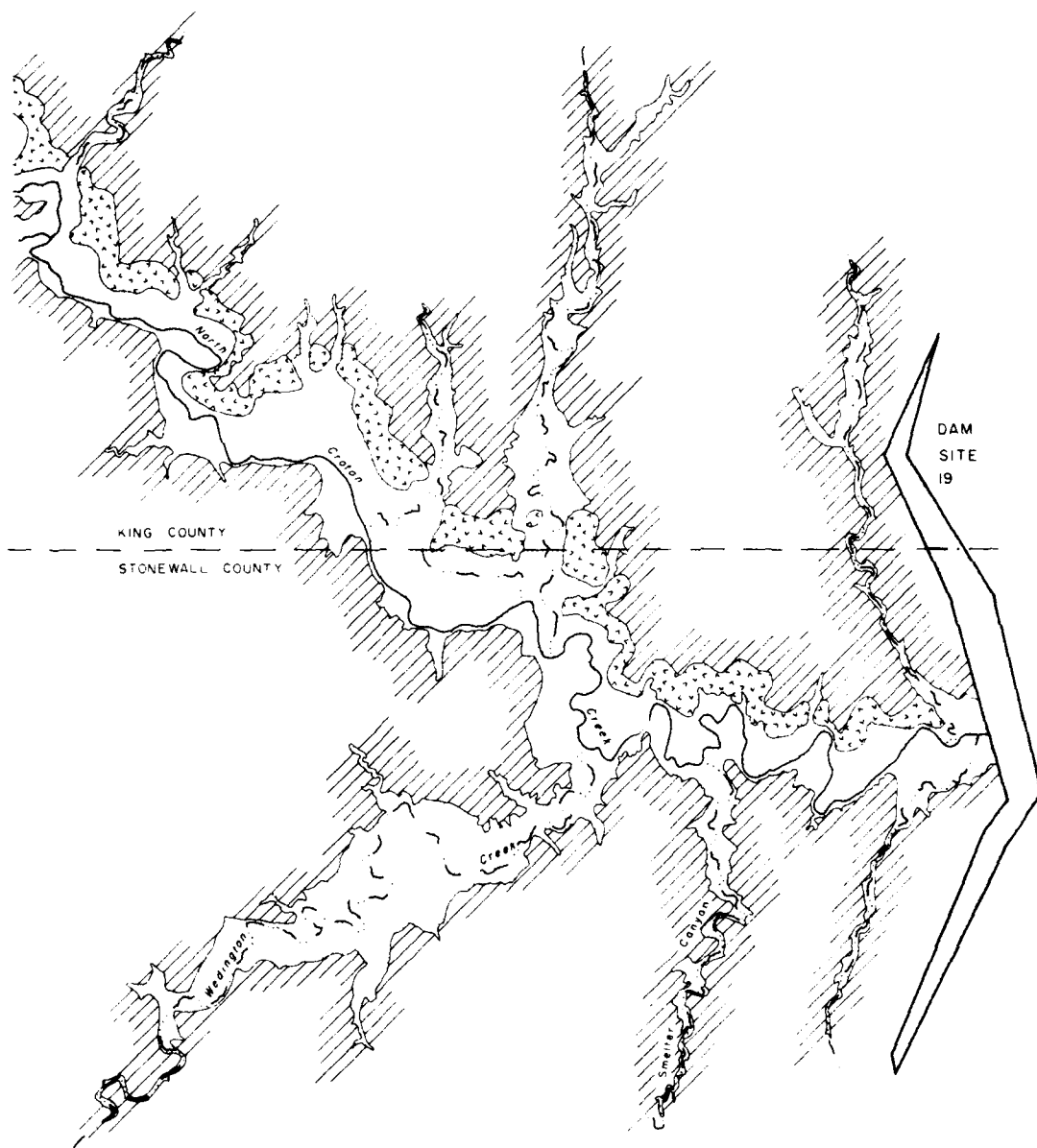


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Figure 25

# BRAZOS NATURAL SALT POLLUTION PROJECT DAM SITE 19

DISTRIBUTION OF ALLUVIAL DEPOSITS ALONG SELECTED SEGMENTS  
OF NORTH CROTON CREEK AND ITS TRIBUTARIES



LEGEND  
 Recent Alluvium  
 12-15m Strath Terrace  
 Permian Bedrock

P841/81/SHP

Adapted From USGS, Kiowa Peak, Kiowa Peak NE & Kiowa Peak NW, Texas, 75 Sheets, 1962, 1967, 1967

The only other terrace observed along North Croton Creek is a wide, fine-grained deposit as much as 6 meters thick and 6 to 9 meters above the creek which essentially chokes the valley of North Croton (c.f., localities L41KG20 and L41SN32, Appendix II). Thin beds of clays, silty-clays, silts and silty fine-sands are apparent throughout exposed sections with no appreciable soil formation at the surface. Again, the thickness of the deposit and lack of soil development suggest that the unit has been aggrading for some time and continues to aggrade at the present time. A local rancher stated that the creek leaves its banks and covers the valley about every 10 to 20 years; in the past, when the terrace was lower, such flooding probably occurred more often because the creek would not have to fill its channel with as much water in order to overtop the bank. Considering the thickness of the deposit, the terrace has probably been aggrading for perhaps 1,000 years; although archeological materials could be contained within the unit, it is expected that they would be deeply buried.

There is no modern floodplain along North Croton Creek, and the stream flows in a deep narrow channel which apparently lacks the ability to erode the 6-meter terrace. However, evidence of apparent recent meander scars and ox-bows on topographic maps and aerial photos indicates that the creek occasionally shifts channels along some of its reaches.

There is considerable variety in the nature of valley fills along tributaries of North Croton Creek. At the upper end of the reservoir, the steep narrow canyons preclude the presence of older alluvium. The creek regularly moves back and forth within its narrow valley and removes any older fill.

Wedington Creek, which is near the downstream end of the reservoir area, is filled with material quite similar to that observed in the 6-meter terrace along North Croton Creek, and the two units may represent the same recent depositional episode.

Along the first major tributary entering North Croton Creek from the north, immediately west of the dam axis, there seems to be a sequence of valley filling. In the upper portion of this drainage (termed "Bradley Canyon" by the survey crews), the valley is wider than it is to the south. Apparently as the creek entrenches to the south it cuts into more resistant beds of the lowermost San Angelo Formation and uppermost Choza Formation and forms a relatively narrow steep canyon. Along upper Bradley Creek in the area of Survey Units A-191 and A-199 fill terraces exist at elevations of 5 meters and 1 meter above the creek floor. The upper fill exhibits a moderately well-developed soil (A/cambic B) suggesting it is of some age (mid to early late Holocene?) and could contain archeological materials. The lower terrace appears to be quite recent.



## SUMMARY

Geologic investigations concerning the Quaternary history of Croton, Salt Croton and North Croton creeks, particularly as it relates to human occupation, demonstrate that there is considerable variation in the alluvial histories of the three drainages. These variations are apparently a function of factors which probably include bedrock texture, bedrock competence and size of drainage area although there are undoubtedly other, more subtle, localized variables involved.

All of the valleys are filled with fine-grained alluvium which in most cases is quite young and is the result of overbank floodplain deposition. Only along Croton Creek (Dam Site 10) and in Southerland Canyon (a tributary of Salt Croton, Dam Site 14) were there any significant fine-grained alluvial deposits of early late Holocene age or older. The indications are that the creeks have been active and have alternately cut out older alluvium (which may have contained archeological materials) and replaced it with massive deposits of recent fine-grained sediments. Generally, the next older deposits are gravels which cap strath terraces and are of late Pleistocene age or older. These older gravels provide a ready source of raw material suitable for stone-tool manufacture.

The variations in the alluvial record among the three drainages investigated demonstrate the difficulties in correlating fluvial units between drainages. Indeed, on the basis of the available data, it is not possible to correlate individual tributaries with the mainstem each enters within the project area.

The recent age of most of the alluvium along the creeks undoubtedly accounts for the paucity of archeological materials found along the valley bottoms. The relatively old age of many of the higher surfaces accounts for most of the sites in these areas being only surface finds. Additionally, the extreme erosion observed throughout the area may account for both the low number of sites found and the scattered diffuse nature of many that were recorded.

APPENDIX VI: Detailed Soils Mapping and Soils Descriptions  
for Selected Portions of the Brazos Natural  
Salt Pollution Control Project Area

Leroy E. Werchan

and

J. Peter Thurmond

## INTRODUCTION

This appendix provides detailed mapping of the soils in the immediate vicinities of the Dam Site 14 basin (Fig. 26) and that portion of the Dam Site 19 basin which falls within King County (Figs. 27 and 28). Soil Conservation Service (SCS) soil surveys have recently been published for Kent and Stonewall counties (Richardson and Girdner 1973; Goerdel and Watson 1975). However, no SCS soils mapping has been performed to date in those sections of King County relevant to the present study, and there is no published soil survey for the county. The northern portions of the Dam Site 14 and Dam Site 19 basins lie within King County. Therefore, the field investigations of the senior author were directed toward gathering soils information for the relevant areas in King County that is equivalent to the data available in the published surveys for the remainder of the project area.

An analysis of 1:20 000-scale panchromatic imagery was combined with intensive field checking to produce the information reported in this appendix. The soils have been grouped into existing SCS series, then mapped and described on the basis of those classes. A representative pedon of each class was described in the field. In order to ensure compatibility with the published surveys, our reporting of this data follows the standard SCS terminology and format.

## SOIL UNIT DESCRIPTIONS

### COLORADO SOILS

The Colorado soils are Typic Ustifluvents associated with the recent alluvium which occupies the valley of North Croton Creek and its tributaries in the Dam Site 19 basin. Their pedogenic counterpart in the Dam Site 14 basin is the Yomont very fine sandy loam. As their classification indicates, alluvial deposition occurs with sufficient frequency within this mapping unit to prevent the development of any soil horizons other than an ochric epipedon. Exposed profiles of these soils often exhibit a series of buried A horizons, and fluvial stratification is quite clearly preserved. These soils slope over 1 percent in areas adjacent to the uplands but are usually nearly level elsewhere with a slope quotient of approximately 0.5 percent or less. Colorado soils developed under a cover of mid and tall grasses.

Typically, the surface layer is a brown calcareous clay loam approximately 30 centimeters thick. It can range from 10 to 35 centimeters in thickness and varies from brown to reddish brown in color. In some places, particularly near sloughs or other depressed areas, the surface horizon may be a clay in texture. Underlying this epipedon is up to several meters of stratified alluvium which ranges in texture from fine sandy loam to clay loam or clay.

## APPENDIX VI: SOILS

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A typical profile as described in the Dam Site 19 basin is as follows:

- A1 0 to 30 cm, brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist, moderate, fine, granular structure; slightly hard, very friable; calcareous, moderately alkaline; abrupt, smooth boundary.
- C 30 to 150 cm, light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; massive but porous, several thin bedding planes of lighter-colored fine sandy loam; calcareous, moderately alkaline.

### COTTONWOOD-OWENS ASSOCIATION

This is an association of two major soils, the Cottonwood loam and the Owens clay, which occupies much of the uplands surrounding the central and western portions of the Dam Site 19 basin. Included in this broad mapping unit are minor areas, too small for illustration on a scale suitable for publication, of the Tillman and Vernon clay loams. These soils have developed in an outcrop area of complex interbedded dolomites, gypsums, shales and silty, fine-grained sandstones of the Permian Blaine Formation. The differential resistance to erosion of these materials has produced a benched, stair-step topography. Slopes average about a 5 percent gradient but are nearly level atop the bedrock benches and range up to 10 percent along the scarps which separate the benches. Soil occurs only atop the benches; the intervening scarps have typically been scoured to bedrock by erosion. These soils developed under a cover of short and mid grasses.

Cottonwood soils usually comprise a 15-centimeter thick, grayish brown, calcareous loam over gypsum or dolomite, while the Owens soils have an approximately 45-centimeter thick surface layer of reddish brown calcareous clay over shaly clay. Surfaces of Cottonwood may form light brownish gray to brown clay loam, while Owens varies from brown to reddish brown clay, silty clay or clay loam. The Cottonwood soils tend to occur along the leading edges of the benches, and the Owens soils on their more protected rearward portions at the bases of the intervening scarps. Active erosion has severely limited the formation of any soil horizons. The Cottonwood soils are classifiable as Ustic to Lithic Torriorthents, and the Owens soils as Typic Ustochrepts.

Typical profiles of these soils, as described in detail in the vicinity of the Dam Site 19 basin, are as follows:

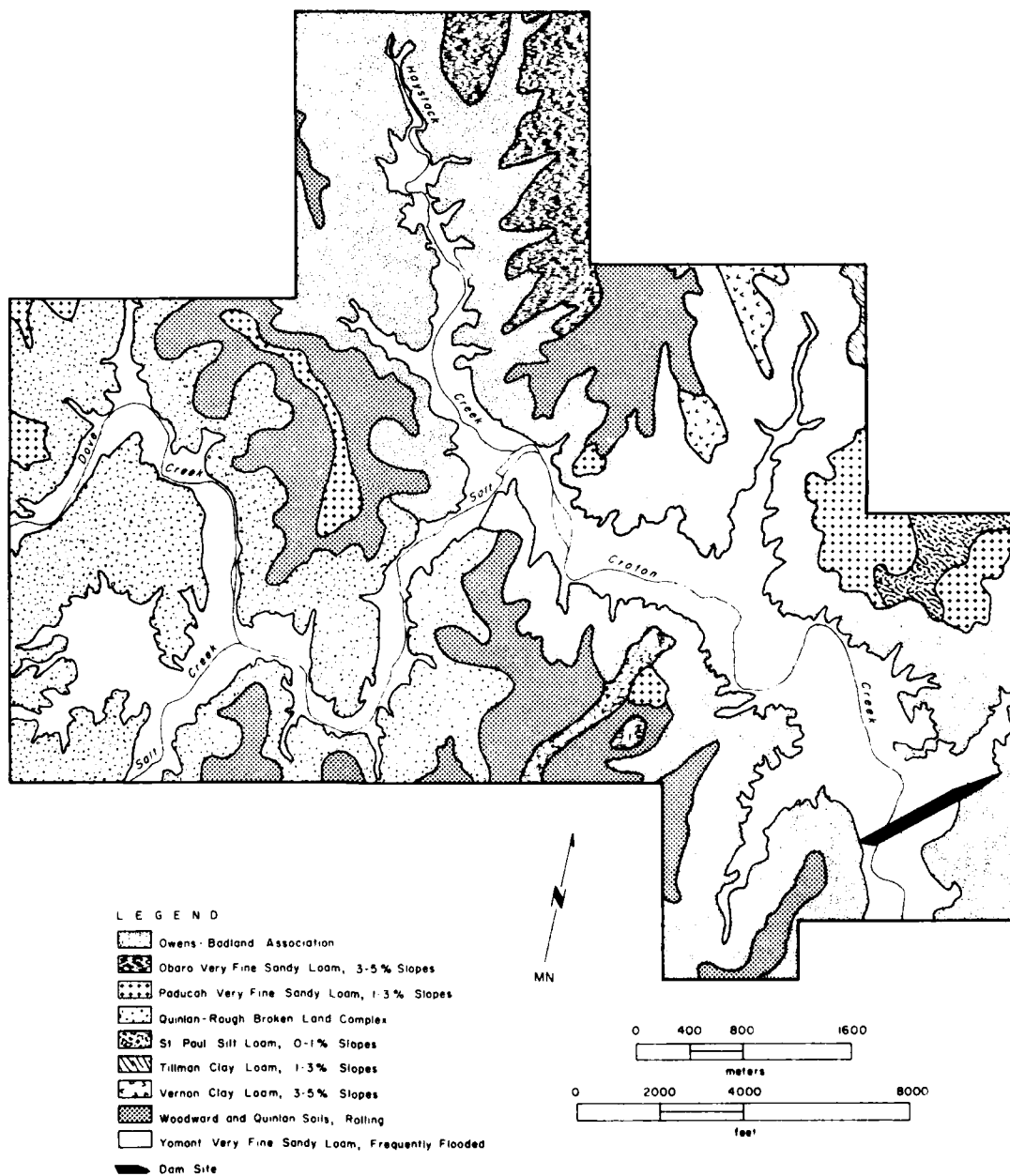
#### Cottonwood clay loam:

- A1 0 to 23 cm, grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate, fine, granular structure; soft, friable; calcareous, moderately alkaline; abrupt, wavy boundary.
- C 23 to 50 cm, white (10YR 8/2) calcareous, soft chalky gypsite, which becomes hard below 50 cm.

## BRAZOS NATURAL SALT POLLUTION PROJECT

## DAM SITE 14

## DISTRIBUTION OF SOIL UNITS



## APPENDIX VI: SOILS

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### Owens clay:

- A1 0 to 15 cm, brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate, fine, subangular blocky structure; a few fragments of limestone on the surface; very hard, very firm; calcareous, moderately alkaline; gradual, smooth boundary.
- Bca 15 to 45 cm, brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate, medium, subangular blocky structure; very hard, very firm, few films and masses of calcium carbonate, calcareous, moderately alkaline; gradual, smooth boundary.
- C 45 to 70 cm, red and gray interbedded layers of shaly clay; massive; calcareous, moderately alkaline.

### OBARO VERY FINE SANDY LOAM, 3 TO 5 PERCENT SLOPES

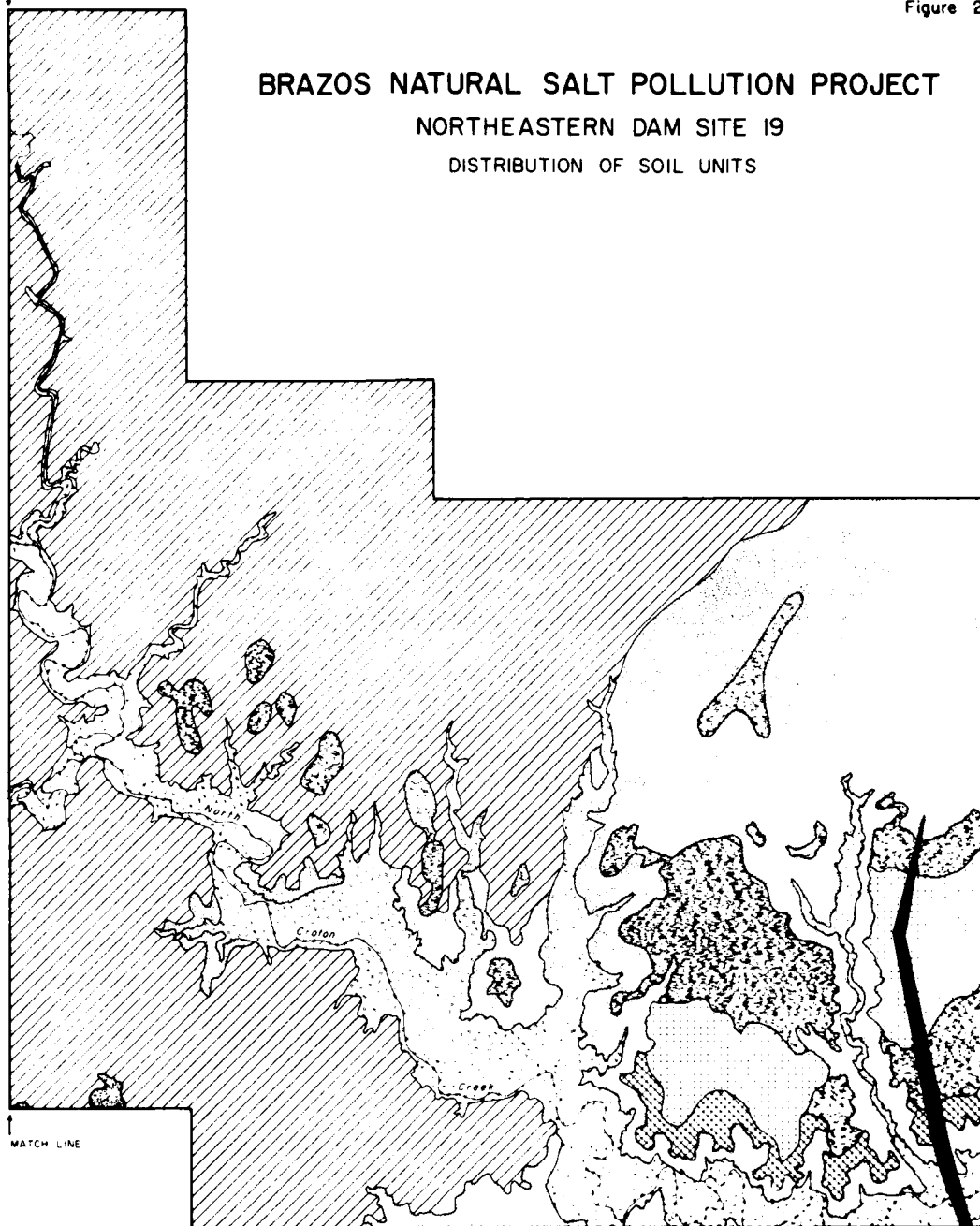
This soil, a Typic Ustochrept, developed on moderately sloping outcrops of calcareous, loamy, poorly consolidated sandstone red beds of the Permian Blaine Formation in the Dam Site 14 basin. Tall and mid grasses dominated the plant community in its climax community. At the present time, however, the associated vegetation is composed mostly of short grasses, forbs, mesquite and juniper. Overgrazing has led to fairly severe erosion in places.

Uneroded Obaro soil areas typically have a surface layer of reddish brown, very fine sandy loam approximately 12 centimeters thick. From place to place this layer ranges from less than 10 centimeters to 30 centimeters in depth, and in color from reddish brown to dark reddish brown. The next layer, approximately 25 centimeters in thickness, is a reddish brown loam in the upper part grading downward to a light red loam. In many pedons, there is some accumulation of calcium carbonate, particularly in the lower part. The parent material is generally 50 to 100 centimeters below the surface and consists of weakly cemented calcareous silt and sandstone.

A typical profile of the Obaro very fine sandy loam as it occurs in the Dam Site 14 area is as follows:

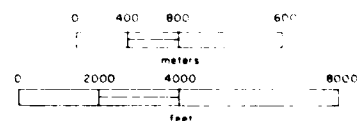
- A1 0 to 12 cm, reddish brown (5YR 5/4) loam, dark reddish brown (5YR 4/4) moist; weak, subangular blocky structure; slightly hard, very friable; few sandstone fragments; calcareous, moderately alkaline; clear, smooth boundary.
- B2 12 to 35 cm, reddish brown (2.5YR 5/4) loam, dark reddish brown (2.5YR 4/4) moist; weak to moderate, fine, granular structure; slightly hard, very friable; a few films and threads of calcium carbonate; calcareous, moderately alkaline; gradual, smooth boundary.

# BRAZOS NATURAL SALT POLLUTION PROJECT NORTHEASTERN DAM SITE 19 DISTRIBUTION OF SOIL UNITS



## LEGEND

- Colorado Soils
- Cottonwood-Owens Association
- Owens-Badland Association
- Taiga-Yates Complex
- Tulman Clay Loam, 0-1% Slopes
- Tulman Clay Loam, 1-3% Slopes
- Vernon Clay Loam, 1-3% Slopes
- Dam Site



## APPENDIX VI: SOILS

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B3ca 35 to 60 cm, light red (2.5YR 6/6) loam, red (2.5YR 5/6) moist; weak, fine, granular structure; hard, friable; many calcium carbonate concretions; calcareous, moderately alkaline; clear, smooth boundary.

C 60 to 150 cm, red (2.5YR 5/6) weakly cemented sandstone, dark red (2.5YR 4/6) moist.

### OWENS-BADLAND ASSOCIATION

This mapping unit occurs in association with two major geologic outcrops: the interbedded gypsum and red bed shaly clays of the upper Blaine Formation in the eastern Dam Site 14 area, and similar materials of the San Angelo Formation in the eastern Dam Site 14 basin. Physiographically, the unit occupies sloping to strongly sloping upland areas and valley margin slopes. Owens soils occur on the more moderate slopes within the unit, averaging approximately 6 percent. The Badlands portion consists mostly of steep escarpments. Where the parent material is locally sandy, small areas typical of the Quinlan-Rough Broken Land Association may also occur within this mapping unit.

The Owens part of the unit consists of about 15 centimeters of brown calcareous clay. The underlying material to a depth of 75 centimeters or more is a red or gray shaly clay characterized by a substantial calcium carbonate accumulation. From place to place the Owens epipedon may vary in depth from 10 to 20 centimeters and in color from brown to reddish brown. The subsurface horizon may be 20 to 35 centimeters thick and varies from brown to reddish brown in color. Unmodified parent material lies 30 to 50 centimeters below the surface and is a red, reddish brown, gray or olive shaly clay. The Owens clay can be classified as a Lithic Ustochrept.

The Badlands sections occupy steep escarpments and other severely eroded areas within the unit. These areas are often practically barren of vegetation, and erosion has exposed unmodified parent material at the surface. Overgrazing has fostered expansion of the areal extent of the Badlands through erosion.

Much of the Owens-Badlands unit must have been capable of sustaining a moderate growth of mid to tall grasses prior to the advent of ranching. However, in its present condition there is only a sparse cover of short grasses, annual forbs, mesquite and juniper. Extensive erosion continues to occur.

A detailed description follows of a typical pedon of Owens clay observed in the Dam Site 14 area.

A1 0 to 15 cm, brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate, fine, subangular blocky structure; very hard, very firm, a few fragments of limestone on the surface; calcareous, moderately alkaline; gradual, smooth boundary.

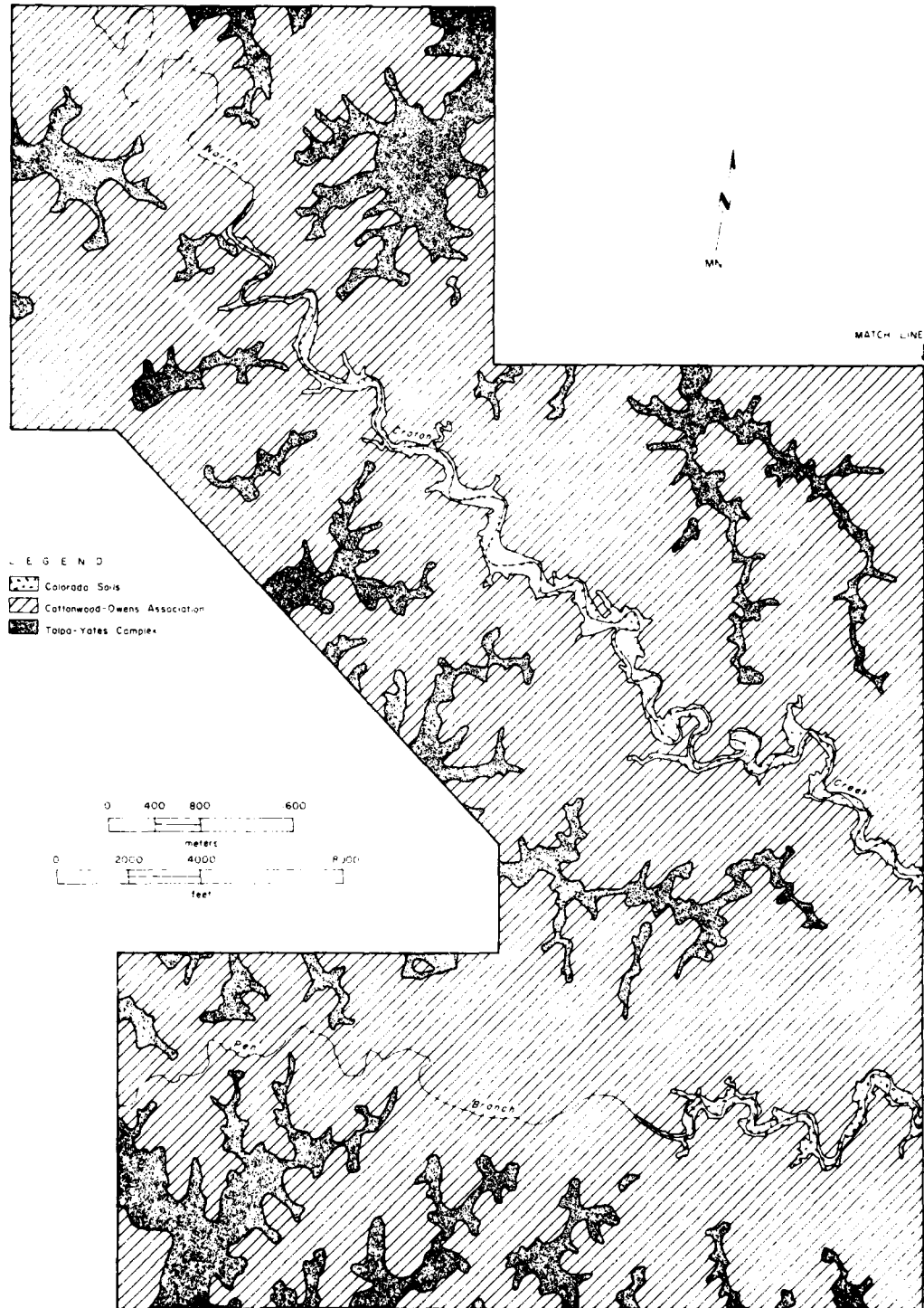


Figure 28

# BRAZOS NATURAL SALT POLLUTION PROJECT

## NORTHWESTERN DAM SITE 19

### DISTRIBUTION OF SOIL UNITS



## APPENDIX VI: SOILS

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B2ca 15 to 40 cm, brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate, medium, angular blocky structure; extremely hard, very firm; few films and soft masses of calcium carbonate; calcareous, moderately alkaline; gradual, smooth boundary.

C 40 to 76 cm, red and gray interbedded layers of shaly clay; massive; calcareous, moderately alkaline.

### PADUCAH VERY FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES

This gently sloping soil occurs high in the uplands on convex surfaces of approximately 2.5 percent gradient. It developed from calcareous, loamy and sandy red bed clastics of the Permian Whitehorse Group outcropping in the Dam Site 14 area. Mid and tall grasses probably dominated its climax vegetation, but overgrazing has produced a community of short grasses, forbs and mesquite. The soil is classifiable as a Typic Haplustalf.

Typically, this soil has a neutral, reddish brown, very fine sandy loam epipedon about 20 centimeters thick. This horizon varies from 15 to 30 centimeters in depth and from reddish brown to brown in color. The next horizon, approximately 100 centimeters thick, is a neutral reddish brown sandy clay loam that becomes red and calcareous in the lower part. This horizon ranges from 50 to 130 centimeters in thickness and from sandy clay loam to loam in texture. The underlying parent material is a red, calcareous, loamy, poorly consolidated sandstone of Permian age.

The following is a detailed description of a typical pedon of Paducah very fine sandy loam as it occurs in the Dam Site 14 area.

A1 0 to 20 cm, reddish brown (5YR 4/4) very fine sandy loam, dark reddish brown (5YR 3/4) moist; weak, fine, granular structure; slightly hard, very friable; neutral; clear, smooth boundary.

B2t 20 to 75 cm, reddish brown (2.5YR 4/4) sandy clay loam, dark reddish brown (2.5YR 3/4) moist; moderate, fine and medium, subangular blocky structure; very hard, firm; a few thin clay films; neutral; gradual, smooth boundary.

B3 75 to 120 cm, red (2.5YR 4/6) sandy clay loam, dark red (2.5YR 3/6) moist; fine, granular and medium, subangular blocky structure; hard, friable; calcareous, mildly alkaline; gradual, smooth boundary.

Clca 120 to 170 cm, light red (2.5YR 6/6) loam, red (2.5YR 5/6) moist; hard, friable; few films and threads of calcium carbonate; calcareous, moderately alkaline; diffuse, smooth boundary.

C2 170 to 190 cm, red (2.5YR 5/6) sandy, poorly consolidated red bed material of Permian age.

## QUINLAN-ROUGH BROKEN LAND COMPLEX

This map unit occupies a stairstep topography of small benches and steep intervening scarps in the upper reaches of the Dam Site 14 basin. Interbedded gypsum and poorly consolidated sandstone of the Permian Whitehorse Group outcrop within this unit. The gypsum beds are more resistant to erosion and act as caprocks which form benches wherever they outcrop. Quinlan soils, which are shallow, calcareous, very fine sandy loams classifiable as Lithic or Typic Ustochrepts, occupy the nearly level bench surfaces. The intervening scarps are quite steep, sloping from 20 to 45 percent, and constitute the Rough Broken Land part of the complex. Erosion has exposed unaltered bedrock along these scarps.

Even prior to ranching, the vegetal cover of this unit must have been minimal. The Quinlan soils atop the benches probably supported a moderate growth of mid grasses with only a sparse cover of short grasses along the scarps. At the present time, the benches exhibit a sparse cover of short grasses and cacti, and the scarps are virtually devoid of vegetation.

The typical Quinlan soil has a reddish brown, calcareous, very fine sandy loam epipedon about 20 centimeters thick. The epipedon may range from 10 to 30 centimeters in depth and from reddish brown to red in color. There is a subsurface horizon, also typically about 20 centimeters thick, of yellowish red, calcareous, very fine sandy loam. The underlying parent material is a red, calcareous, poorly consolidated sandstone approximately 40 centimeters below the surface but ranging from 25 to 50 centimeters in depth below the surface.

A detailed description follows of a typical Quinlan very fine sandy loam pedon observed in the Dam Site 14 area.

- A1 0 to 20 cm, red (2.5YR 4/6) very fine sandy loam, dark red (2.5YR 3/6) moist; weak, fine, granular structure; slightly hard, very friable; calcareous, moderately alkaline; gradual, wavy boundary.
- B2 20 to 40 cm, red (2.5YR 5/6) very fine sandy loam, red (2.5YR 3/6) moist; weak, firm, granular structure; slightly hard, very friable; few films and threads of calcium carbonate; a few pieces of soft sandstone; calcareous, moderately alkaline; gradual, wavy boundary.
- C 40 to 75 cm, red (2.5YR 5/6) and gray (5Y 6/1) weakly cemented sandstones and silts of Permian age.

## ST. PAUL SILT LOAM, 0 TO 1 PERCENT SLOPES

This soil occurs high in the uplands on the eastern end of the Dam Site 14 basin where it has developed on calcareous, loamy, red bed clastics of the Permian Whitehorse Group. Areas of this soil are nearly level to slightly concave and have slope gradients of approximately 0.5 percent. St. Paul silt loam developed under a vegetal cover dominated by mid grasses which are still present in areas which have not been

## APPENDIX VI: SOILS

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overgrazed. However, most areas are now under a cover of short grasses, forbs and mesquite. The soil is classifiable as a Pachic Argiustoll.

The typical St. Paul profile exhibits a brown silt loam epipedon which is about 20 centimeters thick. This surface horizon may vary from 15 to 35 centimeters in thickness and from brown to reddish brown or dark grayish brown in color. The next horizon is a firm clay loam approximately 70 centimeters thick which is dark brown in the upper part grading downward to brown. It can range from 45 to 100 centimeters in thickness, from brown to reddish brown or dark brown in color, and from clay loam to silty clay loam in texture. The third horizon is a friable, very pale brown clay loam or silty clay loam about 15 centimeters thick on average. It exhibits a broad range of colors, from very pale brown to brown, dark brown, reddish brown or yellowish red. This layer is generally calcareous and represents a zone of transition to the underlying parent material which extends to a depth of at least 200 centimeters. The parent material is generally a mottled red, yellowish red and gray calcareous clay loam. It may also be reddish brown, light reddish brown, red or yellowish red loam, silt loam, clay loam or silty clay loam. The developed soil ranges from 100 to 150 centimeters in total depth on average.

A detailed description follows of a pedon of St. Paul silt loam observed in the Dam Site 14 area.

- A1 0 to 20 cm, brown (7.5YR 5/2) silt loam, dark brown (7.5YR 4/2) moist; weak, fine, granular structure; slightly hard, friable; mildly alkaline; clear, smooth boundary.
- B21t 20 to 60 cm, dark brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate, fine and medium, subangular blocky structure; very hard, firm; few thin clay films; mildly alkaline; gradual, smooth boundary.
- B22t 60 to 90 cm, brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/4) moist; moderate, medium, subangular blocky structure; very hard, firm; thin clay films; mildly alkaline; gradual, smooth boundary.
- B3 90 to 105 cm, very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; moderate, medium, subangular blocky structure; hard, friable; calcareous, moderately alkaline.
- Clca 105 to 150 cm, mottled red (2.5YR 4/6) and pinkish gray (5YR 7/2) clay loam, about 5 percent calcium carbonate concretions; calcareous, moderately alkaline; diffuse, smooth boundary.
- C2 150 to 200 cm, yellowish red (5YR 5/6) and gray clay loam; calcareous, moderately alkaline.,

### TALPA-YATES COMPLEX

This mapping unit occupies the narrow, gently sloping crests of upland ridges in the heavily dissected badlands which surround the

western end of the Dam Site 19 basin. Yates soils occur on surfaces with gradients of 1.5 to 5 percent, and Talpa soils occupy surfaces of less than 1.5 percent gradient. The parent materials are clays and clay loams overlying dolomite of the Permian Blaine Formation. The climax vegetation was probably much like that visible today, a moderate cover of short to mid grasses and juniper. The Talpa soils can be classified as Lithic Calciustolls, and the Yates soils as Lithic Ustorthents.

In a representative profile, the Talpa soils exhibit a grayish brown, calcareous clay loam epipedon that is 20 centimeters thick and contains 10 percent dolomite fragments. This horizon ranges from 12 to 35 centimeters in thickness and to dark grayish brown in color. The content of dolomite fragments can range from 5 to 20 percent and increases with depth. The epipedon is directly underlain by hard dolomite.

A typical Yates profile exhibits a reddish brown calcareous clay loam epipedon about 15 centimeters thick that is 45 percent dolomite fragments. This epipedon may vary from 10 to 25 centimeters in depth, and the content of dolomite fragments ranges from 35 to 50 percent. The epipedon is directly underlain by hard dolomite.

Typical profiles of these soils, as described in detail in the vicinity of the Dam Site 19 basin, are as follows:

Talpa clay loam:

A1 0 to 20 cm, grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, subangular blocky and granular structure; slightly hard, friable, slightly sticky; 10 percent, by volume, fine, hard dolomite fragments; calcareous; moderately alkaline; abrupt, irregular boundary.

R 20 to 25 cm, hard dolomite.

Yates clay loam:

A1 0 to 15 cm, reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate, fine, subangular blocky structure; slightly hard, friable; 45 percent, by volume, fine, hard dolomite fragments; calcareous; moderately alkaline; abrupt, irregular boundary.

R 15 to 25 cm, hard dolomite.

TILLMAN CLAY LOAM, 0 TO 1 PERCENT SLOPES

Tillman clay loam occurs high in the uplands along the lower reaches of the Dam Site 14 and Dam Site 19 basins on slightly convex slopes of about .5 percent. It has developed on clays and shales of the Permian Whitehorse Group and San Angelo Formation. Mid grasses dominate this soil in its climax state, but in most places short grasses, annual

## APPENDIX VI: SOILS

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forbs and mesquite now comprise the associated plant community. The soil is classifiable as a Typic Paleustoll.

In a representative profile, the epipedon is a reddish brown, calcareous clay loam about 18 centimeters thick. It ranges from 12 to 40 centimeters in thickness and to brown or dark brown in color. The second horizon is a calcareous clay about 100 centimeters thick that is reddish brown in the upper part and red in the lower part. Texture ranges to clay loam and color to yellowish red and dark red. Below this there is approximately 50 centimeters of light red and gray clay. The underlying parent material, to a depth of more than 230 centimeters, is a light red and gray compact shaly clay. It may vary to a clay loam, clay, shaly clay or poorly consolidated shale in various shades of red, gray or brown.

A detailed description follows of a typical Tillman clay loam pedon observed in the Dam Site 19 basin.

- A1 0 to 18 cm, reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate, medium, granular structure; very hard, friable; calcareous, moderately alkaline; clear, smooth boundary.
- B21t 18 to 50 cm, reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate, medium, subangular blocky structure; hard, firm; clay films; calcareous, moderately alkaline; clear, smooth boundary.
- B22t 50 to 90 cm, reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; moderate, medium, blocky and subangular blocky structure; very hard, firm; clay films; calcareous, moderately alkaline; diffuse, wavy boundary.
- B23 90 to 120 cm, red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; tca moderate, medium, subangular blocky structure; very hard, firm; clay films; about 5 percent calcium carbonate concretions; calcareous, moderately alkaline; diffuse, wavy boundary.
- B3 120 to 165 cm, weak red (10YR 4/4) and gray (5YR 6/1) clay; moderate, medium, subangular blocky structure; very hard, firm; about 25 percent flakes and particles of red bed materials; calcareous, moderately alkaline; diffuse, wavy boundary.
- C 165 to 230 cm, weak red and gray shaly clay; extremely hard, very firm, noncalcareous.

### TILLMAN CLAY LOAM, 1 TO 3 PERCENT SLOPES

This soil is like the Tillman clay loam, 0 to 1 percent slopes, except that it occurs on slopes of approximately 2 percent gradient. Because of its greater slope, there is a greater potential for erosion and the soil profile tends to be vertically compressed relative to the more gently sloping Tillman soils.

## VERNON CLAY LOAM, 1 TO 3 PERCENT SLOPES

This gently sloping soil occurs at the crest of the left bank valley margin slope above North Croton Creek along the lower reaches of the Dam Site 19 basin. The slopes are weakly convex and have a mean gradient of 2 percent. It has developed on shaly clays of the Permian Choza Formation. In its climax condition, the associated plant community is dominated by mid and tall grasses. With range deterioration, these are replaced by short grasses, annual forbs and mesquite. The soil is classifiable as a Typic Ustochrept.

A typical profile exhibits a reddish brown calcareous clay loam epipedon of about 18 centimeters depth. It varies from 10 to 30 centimeters in depth, to brown, red, reddish gray or yellowish red in color. The underlying parent material, extending to a depth of 120 centimeters or more, is a red, pale red, yellowish red or reddish brown shaly clay.

The following is a detailed description of a typical Vernon clay loam pedon observed in the Dam Site 19 basin.

- A1 0 to 18 cm, reddish brown (5YR 5/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate, fine, subangular blocky structure; hard, friable; calcareous, moderately alkaline; clear, smooth boundary.
- B2 18 to 50 cm, reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; weak, medium, blocky structure; hard, firm; a few films, threads and concretions; calcareous, moderately alkaline; clear, smooth boundary.
- B3ca 50 to 75 cm, red (2.5YR 4/6) clay, dark reddish brown (2.5YR 3/4) moist; weak, subangular blocky structure; a few hard calcium carbonate concretions; calcareous, moderately alkaline; diffuse, smooth boundary.
- C 75 to 120 cm, red (10R 5/6) shaly clay, dark red (10R 3/6) moist; red bed clays and shales; a few hard calcium carbonate concretions; generally noncalcareous except near the concretions.

## VERNON CLAY LOAM, 3 TO 5 PERCENT SLOPES

This soil is very similar to the Vernon clay loam, 1 to 3 percent slopes. It occurs in a very similar physiographic position on the lower end of the Dam Site 14 basin in association with an outcrop of Permian Whitehorse Group shaly clay. The primary difference is that this soil occurs on slopes with a mean gradient of 3.5 percent. As a result, there is a greater potential for erosion, and the epipedon tends to be thinner than is the case for the Vernon soils in the Dam Site 19 basin.

## WOODWARD AND QUINLAN SOILS

This mapping unit occurs in the Dam Site 14 area in association with a rolling upland terrain in which slopes average 5 to 12 percent. In this landscape, ridges are relatively narrow and the sideslopes are long. Woodward soils occupy the gentler slopes within this unit, while Quinlan soils tend to occur on surfaces with a slope gradient in excess of 9 percent. These soils have developed on loamy, poorly consolidated sandstones of the Permian Whitehorse Group. Mid grasses probably dominated the plant community in its climax condition. These grasses still occur in places, but most areas have been overgrazed, leading to replacement by short grasses, annual forbs and mesquite. Both the Woodward and Quinlan soils can be classified as Typic Ustochrepts.

The typical Woodward soil has a reddish brown, calcareous, very fine sandy loam epipedon which is about 25 centimeters thick. It may vary in thickness from 20 to 30 centimeters, to a loam or silt loam in texture, and to brown, reddish yellow or yellowish red in color. The next horizon is a friable, calcareous, very fine sandy loam about 65 centimeters thick that is reddish brown in the upper part, grading downward to red. This horizon ranges from 25 to 100 centimeters in thickness, to loam or silt loam in texture, and dark brown, light red or reddish yellow in color. Calcareous, loamy, poorly consolidated sandstone typically occurs at about 85 centimeters below the surface but may vary from 50 to 100 centimeters in depth. Locally, the parent material is noncalcareous.

The typical Quinlan soil has been described under the Quinlan-Rough Broken Land map unit. The primary difference between the Woodward and Quinlan soils is that the former are moderately deep and the latter tend to be relatively shallow.

The following is a detailed description of a typical Woodward very fine sandy loam pedon observed in the Dam Site 14 area.

- A1 0 to 25 cm, reddish brown (5YR 4/4) very fine sandy loam, dark reddish brown (5YR 3/4) moist; weak, fine, granular structure; slightly hard, very friable; calcareous, moderately alkaline; gradual, smooth boundary.
- B2 25 to 60 cm, reddish brown (5YR 5/4) very fine sandy loam, reddish brown (5YR 4/4) moist; weak, fine, granular structure; slightly hard, friable; a few films and threads of calcium carbonate; calcareous, moderately alkaline; gradual, smooth boundary.
- B3ca 60 to 85 cm, red (2.5YR 5/6) very fine sandy loam, red (2.5YR 4/6) moist; weak, fine, granular structure; slightly hard, friable; about 5 percent calcium carbonate concretions; calcareous, moderately alkaline; gradual, wavy boundary.
- C 85 to 130 cm, red (2.5YR 5/6) weakly cemented sandstone and silty red bed materials; red (2.5YR 4/6) moist; calcareous, moderately alkaline.



## YOMONT VERY FINE SANDY LOAM

Yomont soils occur on the recent alluvium occupying the valley floor of Salt Croton Creek and its tributaries in the Dam Site 14 basin. Along the mainstem, slopes tend to be nearly level, but gradients of 1 or 2 percent are common along the smaller tributaries. The parent material tends to be silty to sandy in texture. In its climax state, the associated vegetation is dominated by tall grasses, elm, hackberry and cottonwood. However, range abuse has resulted in a plant community of annual forbs and mesquite over most of the unit. The Yomont soils flood several times in most years and can be classified as Typic Ustifluvents.

The typical Yomont soil exhibits a reddish brown, calcareous, very fine sandy loam epipedon which is about 25 centimeters thick. It ranges from 20 to 30 centimeters in thickness and to light reddish brown in color. The underlying parent material, extending to a depth of 150 centimeters or more, is a light reddish brown, calcareous, very fine sandy loam. Alluvial stratification is clearly visible, with varying sandy textures and colors ranging to light red, yellowish red or reddish yellow.

The following is a detailed description of a typical Yomont very fine sandy loam pedon observed in the Dam Site 14 basin.

- A1 0 to 25 cm, reddish brown (5YR 5/4) very fine sandy loam, reddish brown (5YR 4/4) moist; weak, fine, granular structure; slightly hard, very friable; calcareous, moderately alkaline; abrupt, smooth boundary.
- C 25 to 150 cm, light reddish brown (5YR 6/4) very fine sandy loam, reddish brown (5YR 5/4) moist; structureless; bedding planes evident; thin strata of very fine sand, silt loam, and silty clay loam; calcareous, moderately alkaline.

APPENDIX VII: An Assessment and Overview of the Flora of the  
Brazos Natural Salt Pollution Control Project  
Area

Ray D. Kenmotsu

## INTRODUCTION

An assessment of floral resources was conducted at the proposed dam sites of the Brazos Natural Salt Pollution Control Project area in Kent, King and Stonewall counties. Characterizing the populations on the basis of major dominants and land use, this study provides a regional perspective of the local flora, a plant inventory baseline and a summary of current patterns of distribution and community composition. The most prominent floral species of the project area are listed in Table 35 at the end of this appendix.

Located in north-central Texas along the major headwater tributaries of the Brazos River, the project area includes the headland watersheds of Salt Croton Creek, Croton Creek and North Croton Creek. Situated in the Permian Red Beds of the Osage Plains of the Central Lowlands physiographic province, the canyons formed by these drainages feature a varying topography of broken upland ridges, gradual to steep canyon slopes and alluvial terraces.

## REGIONAL CLASSIFICATION

The flora of the project area, both in species composition and distribution, reflects severe modification from current and previous land-use practices. In order to properly assess the flora of the area, it is thus preferable to provide a perspective on its floristic and regional associations. A number of regional studies and classification systems are applicable to the project area; these provide a background and comparative base from which to view the local vegetation. Although no quantitative study was conducted, these works address the composition, successional development and rangeland characteristics of the regional flora.

In early works, the project area has been considered in a lifezone concept by Bailey (1905) as an inclusion of the semiarid Lower Sonoran Division of the Lower Austral Zone. This semiarid region was viewed as "mesquite plains" which occupied a broad north-south band across one-third of the state.

The generalized treatment of North American biotic provinces offered by Dice (1943) includes the project area in his Comanchian Biotic Province. Covering a substantial area in western Texas and extending north into southwestern Oklahoma, the province is a region of rolling plains and plateaus dissected by canyons. Principal vegetation within the red-bed sector of this province are arid grass forms with interspersed, open stands of mesquite. Focusing on the biotic areas of Texas, Blair (1950) extended the geographic limits of the Kansan Province of the previous work to include the Permian red plains. In addition, a mesquite plains district (Blair 1950; Tharp 1939) is recognized in which the open savannahs are characterized by low mesquite and thorny brush overstories with a grassy understory of gramas (Bouteloua spp.)

and threeawns (Aristida spp.). Other prominent grasses of the red-bed region include the short buffalograss (Buchloe dactyloides), tumblegrass (Schedonnardus paniculatus) and windmillgrass (Chloris spp.) (Tharp 1952).

An analysis of the North American Grassland Formation recognized three major climax grassland types (Carpenter 1940). Within this scheme, the red-bed region is considered a part of the Mixed-Grass Prairie-Plains community. As the name implies, the biotic and ecologic structure of this community issues from its two adjacent associations, the tall-grass prairies to the east and the short-grass plains to the west. Convergence and overlap in the distributions of mesic and xeric species are characteristic of this formation, creating a broad zone of transition that extends from central Saskatchewan to northern Texas. Based on a synthesis of local ecologic studies conducted throughout this zone, several important climax grass species were found to be the binding dominants. The most common tall-grass form was little bluestem (Schizachyrium scoparium) while the shortgrass assemblage consists of blue and hairy gramas (Bouteloua gracilis and B. hirsuta) and buffalograss (Buchloe dactyloides).

In an evaluation of the Mixed Prairie in Texas (Allred 1956), the red-bed region is dominated by a Mixed Prairie climax community with an additional development of a minor post-climax community termed the High Plains Bluestem. Variations in the climax and post-climax communities are considered resultant of edaphic and physiographic influences modifying the plant distributions within the general Mixed Prairie climatic belt. Grass dominants of the climax community include sideoats grama (Bouteloua curtipendula), silver beardgrass (Bothriochloa saccharoides), Texas wintergrass (Stipa leucotricha), cane bluestem (Andropogon barbinodis) and vine mesquite (Stipa obtusum). Under heavy grazing pressure, as is common in the study region, these species are replaced by purple threeawn (Aristida purpurea), various gramas, buffalograss and tobosa grass (Hilaria mutica). The bluestem post-climax community is restricted to areas of sandy canyon breaks, presumably a result of less severe soil and habitat disturbances. The climax grasses of this variant are largely tall-grass forms similar to those of the True Prairie formation, including Indiangrass (Sorghastrum nutans), little bluestem and Canada wildrye (Elymus canadensis). Under grazing pressure these are replaced by gramas, threeawns and windmillgrass. Shrub increasers include mesquite, sumac (Rhus spp.), sand sage (Artemisia filifolia) and shinnery oak (Quercus havardi).

Presently, much of the red-bed region reflects substantial land modification from agricultural and ranchland development. The rich Permian red-beds support cotton, grain sorghum and small grains across upland rolling plains. Ranchland areas exhibit overgrazing and the resultant disclimax with mesquite invasion. Within the dissected drainage basins of the project area, woody scrub communities extend throughout the upland fringes and canyon slopes. Invasion and dominance of bottomland and riparian habitats by woody phreatophytes are evident.

## VEGETATION AREAS

The occurrence and range of plant species are controlled by physical and atmospheric factors. The final distributions of the species are dependent on local environment, competition and the influences of land use. Each species responds to the collective effects of these factors to produce a continuum of intergrading populations across an environmental gradient. In this respect, sharp boundaries between plant communities do not usually occur, but distinguishable units may nonetheless be generally recognized for the purpose of field identification and classification. The current dominant vegetation types within the project area are mostly woody species associated with a very meager ground cover. Three gross vegetation assemblages can be identified; these are summarized below and illustrated in Figure 29.

## JUNIPER-MESQUITE/UPLANDS-SLOPES

Throughout the broken to somewhat level upland slopes, valley margin slopes and bedrock benches of the drainage basins, redberry juniper (Juniperus pinchoti) and mixed woody scrub dominate the floral assemblage. These juniper-dominant uplands represent an extensive biotic district which has been reported to cover the northern one-third of Stonewall County (Litton 1970). The woody species occur in both pure populations and in mixed, open association with mesquite, lotebrush (Ziziphus obtusifolia), wolfberry (Lycium sp.), littleleaf sumac (Rhus microphylla) and catclaw (Acacia greggi). Low shrubby growths of common broomweed (Xanthocephalum dracunculoides) and featherplume (Dalea formosa) grow amidst the juniper on stony, open surfaces of small eroding knolls, while fragrant sumac (Rhus aromatica) and elbowbush (Forestiera pubescens) are common along the upper headward edge of drainage troughs incised into the red clay and dolomite exposures. The general paucity of ground cover in some juniper-dominant areas may be attributable to the grade of the sloping surfaces which promote increased runoff and shallow soil development. This provides few favorable niches for successful rooting of grasses and herbaceous species. In addition to the grazing of domestic livestock which would lead to the elimination of the more palatable species, some patterning of ground cover around the woody species may be attributable to the release by the junipers of inhibitory compounds which retard herbaceous growth (Rice 1974). The sparse ground cover consists primarily of threeawns, Indian blanket (Gaillardia pinnatifida), spike phacelia (Phacelia congesta), dakota vervain (Verbena bipinnatifida), centaury (Centaurium calycosum) and blackfoot (Melampodium leucanthum).

In the Dam Site 19 area, juniper tends to dominate the bare, stony ridges and gentle upper slopes, with the shrub assemblage becoming more variable on the lower slope areas. Some encroachment of this population extends onto the terraces and floodplain, but it is largely restricted to the area above 1,500 feet MSL in the Dam Site 19 basin and to the upper fringes of the Dam Site 10 and Dam Site 14 basins. Fourwing saltbush (Atriplex canescens) and sand sage (Artemisia filifolia) reach

their greatest expression on the colluvial fans below the steep upland slopes along Salt Croton Creek. Other prominent species found in the uplands include agarito (Berberis trifoliolata), mormon tea (Ephedra antisyphilitica), sideoats grama (Bouteloua curtipendula), skeleton plant (Lygodesmia texana), prickly pear cactus (Opuntia sp.) and stork's bill (Erodium texanum).

## MESQUITE-OLD-FIELD/TERRACE-FLOODPLAIN

This community is found on the alluvial floodplains and terrace remnants bordering the channels of the present watercourses. Similar to the Loamy Bottomland range site (U.S. Army Engineer District Staff 1973a:II-34), this habitat is considered to offer the highest potential for grass productivity. With the introduction of livestock and the deterioration in range condition, however, mesquite has invaded such habitats (as well as others) and has become established in over 55 million acres in Texas, much of this within the Mixed Prairie (Allred 1956).

Along North Croton Creek, mesquite, a deep-rooted phreatophyte, dominates the overstory with only a few associated woody shrubs occurring. A few scattered juniper, lotebush and wolfberry were noted but represent minor components of this community. The understory consists of the short buffalograss (Buchloe dactyloides), silverleaf nightshade (Solanum eleagni folium), buffalobur (S. rostratum), pepperweeds (Lepidium sp.), lemon beebalm (Monarda citriodora), rescuegrass (Bromus unioloides) and tasajillo (Opuntia leptocaulis). Many of these same understory species occur in the "old-field" assemblage.

Regarding the proliferation of mesquite, the highly adaptive characteristics of this mesophyte lend themselves well to the role of invader species. In consideration of a few of these characteristics, mesquite possesses a tap root and lateral root system which maximize both ground water and soil moisture availabilities; a short-term physiological response in canopy and leaves similar to xerophytes which promote efficient photosynthesis and enhance survival potential during extreme seasonal conditions; and a mode of seedling establishment adapted for germination only under favorable thermal and moisture conditions (Mooney, Simpson and Solbrig 1977). The ideal conditions for rapid invasion by mesquite generally issue from the presence of large numbers of grazing animals which serve as vectors of seed dispersal, which apply stress on normally competitive grass and forage species, and which severely disturb range sites by trampling (Fisher 1977). Such grazing pressure has influenced the successful establishment of this community type.

In some areas of the floodplain and terrace deposits, open sites exhibiting recent clearing and grazing are presently dominated by grasses and herbaceous species adapted to the disturbed conditions. These are largely pioneer weeds and comprise the "old field" community. Dominants within this community vary with the species' life cycles and with any successional development. The disruption of the native, naturally

# BRAZOS NATURAL SALT POLLUTION PROJECT GENERALIZED PHYSIOGRAPHIC DISTRIBUTION OF MODERN VEGETATION AREAS

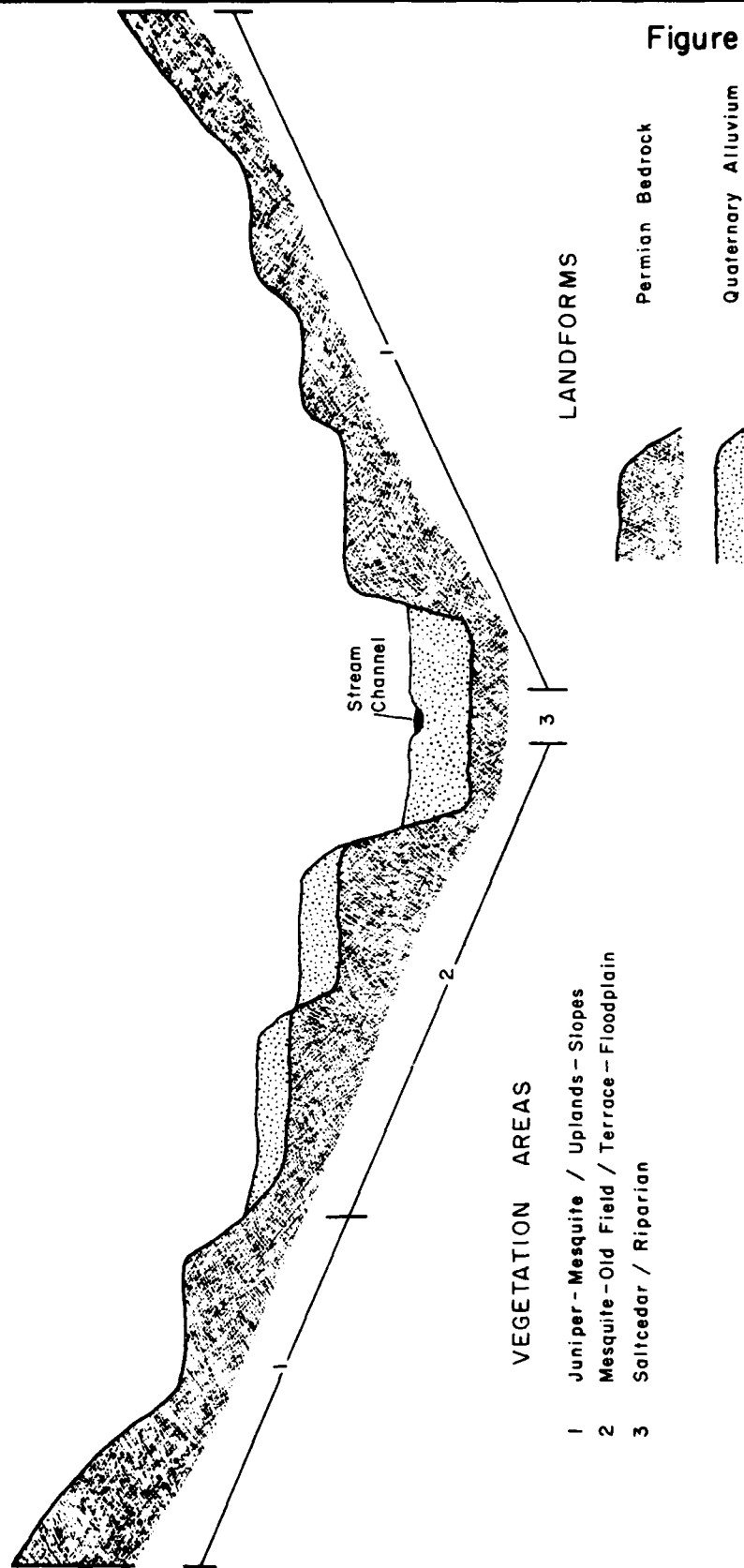


Figure 29

## APPENDIX VII: FLORA

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occurring ecosystem has provided areas of expansion and proliferation of aggressive, highly adaptive species. In addition to the plants already mentioned, other prominent invader species include prickle-poppy (Argemone polyanthemos), windmillgrass, common sunflower (Heliathus annuus) and threeawns.

### SALT CEDAR/RIPARIAN

Lining the cutbanks and moist streambeds of the drainages, thickets of the intrusive Mediterranean saltcedar (Tamarix gallica) form dense populations to the exclusion of most other species. Mesquite and a few individuals of western soapberry (Sapindus drummondii) were the only other species noted along the banks of North Croton Creek. Understory and grass species are not well developed or are nonexistent within most of this habitat. Within the relatively dry streambed of Croton Creek only desert seepweed (Suaeda suffrutescens) was found in open, scattered association with saltcedar on low islands of sandy alluvium.

Addressing the ecology of saltcedar, Bolen and George (1971) point out the halophytic character of saltcedar, its widespread distribution and steady increase along the upper Brazos River Basin, and its high transpiration rates. All species of Tamarix transpire profusely, and among halophytes possess the highest rates of transpiration (Waisel 1972). Its adaptive potential in saline environments is high; this is evidenced by its osmotic adjustments to high salt concentrations and the properties of its principal cellular membranes (Epstein 1980), and by its germination capacity which shows little correlation between salt tolerance in germination and salinity of habitat. In fact, germination capacity tends more to decrease with age of seeds (Waisel 1972).

### COMMENTS

The project area is considered to lie within the Mixed Grassland Prairie which is a broad transitional belt between the True Prairie and Short-Grass Plains.

Due to moisture requirements of the climax species of the bordering grassland formations, some change in the ratio of tall grasses to short grasses is likely to occur with fluctuations in climatic conditions. Where climax communities become established, these changes in relative species density would presumably be more evident along the outer borders of the grassland formations (Carpenter 1940) and to a lesser extent would be anticipated across the Mid-Grass area. Such changes in ratio of grassland type are largely hypothetical, however, since the current patterns of land use have not been favorable for stable development of climax grasslands.

The impact of land use and land modification schemes in the project area is extensive. Long-term grazing has virtually eliminated well-developed populations of climax forms. Most species of reported climax



such as little bluestem, gramas, and Texas wintergrass are only sparsely represented and occur mostly as scattered isolates. Overgrazing has accelerated the encroachment of woody scrub species, resulting in the development of the "mesquite plains." Further, in efforts to cope with the woody invaders, eradication programs devoted to the development and improvement of range conditions are actively pursued in this area. Chaining of upland juniper populations and the herbicide spraying of mesquite are the most common practices.

In sum, these activities have severely disturbed the composition and distribution of climax species within the Mid-Grass Prairie remnant that defines the project area. Reconstruction of floral microenvironments within the project area on the level of detail necessary to the study of aboriginal subsistence patterns is no longer possible.

TABLE 35

PROMINENT FLORAL SPECIES OF THE BRAZOS NATURAL  
SALT POLLUTION CONTROL PROJECT AREA

## Cupressaceae (Cypress Family)

Juniperus ashei (post cedar)Juniperus pinchotii (redberry juniper)

## Ephedraceae (Ephedra Family)

Ephedra antisiphilitica (mormon tea)

## Typhaceae (Cat-tail Family)

Typha latifolia (common cat-tail)

## Gramineae (Grass Family)

Andropogon barbinodis (cane bluestem)Aristida longiseta (red threeawn)Aristida purpurea (purple threeawn)Aristida wrightii (wright threeawn)Bothriochloa saccharoides (silver bluestem)Bouteloua curtipendula (sideoats grama)Bouteloua eriopoda (black grama)Bouteloua gracilis (blue grama)Bouteloua hirsuta (hairy grama)Bromus unioloides (rescuegrass)Buchloe dactyloides (buffalograss)Cenchrus incertus (sand bur)Chloris cucullata (hooded windmillgrass)Chloris virgata (showy chloris)Cynodon dactylon (bermudagrass)Distichlis spicata (inland saltgrass)Elymus canadensis (canada wildrye)Eragrostis curtipedicellata (gummy lovegrass)Eragrostis secundiflora (red lovegrass)Erioneuron pilosum (hairy tridens)Hilaria mutica (tobosa grass)Leptochloa filiformis (red sprangletop)Panicum obtusum (vine mesquite)Panicum texanum (texas panicum)Panicum virgatum (switchgrass)Paspalum distichum (knotgrass)Paspalum setaceum (thin paspalum)Schedonnardus paniculatus (tumblegrass)Schizachyrium scoparium (little bluestem)Setaria geniculata (knotroot bristlegrass)Setaria leucopila (plains bristlegrass)Sorghastrum nutans (indiangrass)Sorghum halepense (johnsongrass)Stipa leucotricha (texas wintergrass)

## Commelinaceae (Spiderwort Family)

Tradescantia occidentalis (prairie spiderwort)

TABLE 35, continued

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|   |
|---|
| Liliaceae (Lily Family)                         |
| <u>Nolina texana</u> (sacahuista)               |
| <u>Smilax bona-nox</u> (saw greenbriar)         |
| <u>Yucca</u> sp. (yucca)                        |
| Salicaceae (Willow Family)                      |
| <u>Populus deltoides</u> (cottonwood)           |
| Fagaceae (Oak Family)                           |
| <u>Quercus havardi</u> (shinnery oak)           |
| Ulmaceae (Elm Family)                           |
| <u>Celtis laevigata</u> (sugar hackberry)       |
| Loranthaceae (Mistletoe Family)                 |
| <u>Phoradendron serotinum</u> (mistletoe)       |
| Chenopodiaceae (Goosefoot Family)               |
| <u>Atriplex canescens</u> (fourwing saltbush)   |
| <u>Chenopodium</u> sp. (goosefoot)              |
| <u>Salsola kali</u> (russian thistle)           |
| <u>Suaeda suffrutescens</u> (desert seepweed)   |
| Amaranthaceae (Amaranth Family)                 |
| <u>Amaranthus retroflexus</u> (redroot pigweed) |
| Ranunculaceae (Crowfoot Family)                 |
| <u>Clematis drummondii</u> (texas virgin bower) |
| <u>Delphinium virescens</u> (plains larkspur)   |
| Berberidaceae (Berberry Family)                 |
| <u>Berberis trifoliolata</u> (agarita)          |
| Papaveraceae (Poppy Family)                     |
| <u>Argemone polyanthemus</u> (pricklepoppy)     |
| Brassicaceae (Mustard Family)                   |
| <u>Dithyreaa wislizeni</u> (spectaclepod)       |
| <u>Draba cuneifolia</u> (wedgeleaf draba)       |
| <u>Lepidium</u> spp. (pepperweed)               |
| Leguminosae (Legume Family)                     |
| <u>Acacia greggii</u> (catclaw)                 |
| <u>Caesalpinia jamesii</u> (rushpea)            |
| <u>Dalea formosa</u> (featherplume)             |
| <u>Prosopis glandulosa</u> (mesquite)           |
| Geraniaceae (Geranium Family)                   |
| <u>Erodium texanum</u> (stork's-bill)           |
| Euphorbiaceae (Spurge Family)                   |
| <u>Croton glandulosus</u> (tropic croton)       |
| <u>Croton texensis</u> (texas croton)           |
| Anacardiaceae (Sumac Family)                    |
| <u>Rhus aromatica</u> (fragrant sumac)          |
| <u>Rhus microphylla</u> (littleleaf sumac)      |
| Sapindaceae (Soapberry Family)                  |
| <u>Sapindus drummondii</u> (western soapberry)  |

Table 35, continued

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|---|
| Rhamnaceae (Buckthorn Family)                         |
| <u>Ziziphus obtusifolia</u> (lotebush)                |
| Tamaricaceae (Tamarisk Family)                        |
| <u>Tamarix gallica</u> (saltcedar)                    |
| Cactaceae (Cactus Family)                             |
| <u>Opuntia leptocaulis</u> (tasajillo)                |
| <u>Opuntia</u> sp. (prickly pear)                     |
| Umbelliferae (Parsley Family)                         |
| <u>Eryngium leavenworthii</u> (eryngo)                |
| Sapotaceae (Sapodilla Family)                         |
| <u>Bumelia lanuginosa</u> (ironwood)                  |
| Oleaceae (Olive Family)                               |
| <u>Forestiera pubescens</u> (elbow bush)              |
| Gentianaceae (Gentian Family)                         |
| <u>Centaureum calycosum</u> (centaury)                |
| Asclepiadaceae (Milkweed Family)                      |
| <u>Asclepias latifolia</u> (broadleaf milkweed)       |
| Hydrophyllaceae (Waterleaf Family)                    |
| <u>Phacelia congesta</u> (spike phacelia)             |
| Verbenaceae (Vervain Family)                          |
| <u>Phyla incisa</u> (texas frog-fruit)                |
| <u>Verbena bipinnatifida</u> (dakota vervain)         |
| <u>Verbena pumila</u> (pink vervain)                  |
| Labiatae (Mint Family)                                |
| <u>Monarda citriodora</u> (common beebalm)            |
| Solanaceae (Nightshade Family)                        |
| <u>Lycium</u> sp. (wolfberry)                         |
| <u>Solanum elaeagnifolium</u> (silverleaf nightshade) |
| <u>Solanum rostratum</u> (buffalobur)                 |
| Plantaginaceae (Plantain Family)                      |
| <u>Plantago</u> sp. (plantain)                        |
| Rubiaceae (Madder Family)                             |
| <u>Galium</u> sp. (bedstraw)                          |
| Cucurbitaceae (Gourd Family)                          |
| <u>Cucurbita foetidissima</u> (buffalo gourd)         |
| Compositae (Sunflower Family)                         |
| <u>Achillea millefolium</u> (western yarrow)          |
| <u>Artemisia filifolia</u> (sand sage)                |
| <u>Cirsium</u> sp. (thistle)                          |
| <u>Gaillardia pinnatifida</u> (indian blanket)        |
| <u>Helenium</u> sp. (sneezeweed)                      |
| <u>Helianthus annuus</u> (common sunflower)           |
| <u>Lygodesmia texana</u> (skeleton plant)             |
| <u>Machaeranthera</u> sp.                             |
| <u>Melampodium leucanthum</u> (blackfoot)             |
| <u>Psilostrophe</u> sp. (paperflower)                 |

TABLE 35, continued

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Ratibida columnaris (upright prairie-coneflower)  
Xanthium strumarium (cocklebur)  
Xanthocephalum dranunculoides (common broomweed)

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PART 2

HISTORIC RESOURCES

by

Martha Doty Freeman

## INTRODUCTION TO THE STUDY

During July and August of 1981, the author spent 25 days conducting a preliminary assessment of the cultural resources of the Brazos Natural Salt Pollution Control Project area in northeastern Kent, southern King and northern Stonewall counties, Texas. The historical investigations were directed toward recording historic sites within and immediately adjacent to the project area and toward the development of a regional historical framework into which this site-specific information might be placed.

During eight days of field investigations, the historian visited sites previously recorded by the archeological survey crews or the Project Archeologist and recorded additional historic sites and structures identified in interviews with local residents or through documentary research. Seventeen historic sites were recorded in this manner. Documentary materials examined in the field include deed records, marks and brand records and assessor's abstracts located in the Kent, King and Stonewall county courthouses. Secondary sources, some of which were not available in Austin libraries, were examined in public institutions in Jayton and Aspermont. Local historians and other individuals familiar with county histories, local ranches and specific historic sites were interviewed, and their information was used to amplify the materials collected in county repositories.

The field investigations were followed by research at libraries and private collections in Austin. Several maps which were not available at local repositories were provided by Elizabeth A. H. John, who has researched early Spanish and Mexican expeditions in western and northwestern Texas. Census records at the Texas State Library were used, and a full range of primary and secondary sources was examined at the Barker Texas History Center of The University of Texas at Austin. In particular, maps in the M. L. Crimmins Collection were found to be essential to tracing nineteenth-century military routes and expeditions through the survey area.

Finally, materials from the Historic Marker files at the Texas Historical Commission were examined. Such files pointed to the existence of important historic sites within or near the project area but either tended to disprove the existence of such sites (even though the markers had been approved) or did not provide conclusive evidence pertaining to specific site locations.

The following report first traces the recorded history of the project area from earliest contacts with Comanche Indians in the early 1800s, through their confinement and the depredations of Anglo buffalo hunters in the 1870s, to the history of ranching in the area since the 1880s. Wherever possible, connections between recorded sites and known events are recorded. Finally, the history of the project area and site-specific management recommendations are summarized. Individual descriptions of the 17 recorded historic sites are presented as Appendix I, and Appendix II provides information regarding historic sites in the project

## PART 2: HISTORIC RESOURCES

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area which are known to the author but which were not recorded due to field time constraints.

### INTRODUCTION TO THE HISTORIC RESOURCES

The upper Brazos River valley, the area of the Salt and Double Mountain forks which embraces portions of northeastern Kent, southern King and northern Stonewall counties, is a land of startling contrasts. Topographically, the region lies east of the level tablelands of the Llano Estacado and west of the Cross Timbers. It is punctuated by notable natural landmarks such as Kiowa Peak and Double Mountain, and is cut by innumerable streams such as Croton Creek, some of which are so impregnated with halite and selenite that the water is undrinkable. On the other hand, the desolation of much of the area is relieved by canyons which feed into main stream systems and contain small running springs, forage and protection from the winter blizzards which sweep in off the Llano. In the course of two trips through the area, Captain Randolph Marcy described the vicinity of the nearby Wichita River as "the most uninteresting and forbidding land I have ever visited . . . barren and parsimonious . . .," and the plains around Double Mountain as among the most beautiful and fertile he had ever seen (United States 1855:10-11; United States 1850:217).

Historically, the area was called "The Breaks," and more specifically, "The Croton Breaks" and "Little Arizona." It lay at the heart of eighteenth- and nineteenth-century Comancheria, but because of certain natural resources it soon attracted the interest of Spanish and Anglo-American entrepreneurs. As early as the late eighteenth century, the vicinity of the Croton Breaks lying north of Double Mountain, east of Duck Creek and west of Kiowa Peak probably was traversed by Jose Mares who had been commissioned to find a trade route between San Antonio and Santa Fe; by Albert Pike in 1832; traders on the Chihuahua Trail from Mexico to Missouri in 1839-1840; Captain R. B. Marcy in 1849 and 1854; and the numerous expeditions of General Ranald Mackenzie and the Fourth U.S. Cavalry in the 1870s.

The vast buffalo herds which congregated around the Croton Breaks between the Wichita and Double Mountain Fork in the 1870s brought scores of buffalo hunters who camped on Croton Creek and took their hides to Rath City some 15 miles south of present-day Aspermont. By 1880 the herds were gone. Decimated by hunters who killed one million animals in 1877 alone, the near-extinction of the buffalo herds also destroyed the lifeblood of the Comanche Indians.

With the disappearance of the Comanche barrier, Anglo-American development of the South Plains began in earnest. By 1879, Mark Lynn of Palo Pinto County moved his LIL brand to North Croton Creek near Kiowa Peak. J. J. Hittson, also of Palo Pinto County, moved his herds to the Double Mountain Fork and ran cattle north to Croton Creek and the vicinity of present-day Jayton. In the vicinity of Salt and North Croton creeks were herds belonging to the Moyne Land & Cattle Company and later

the Louisville Land and Cattle Company, predecessor to S. B. Burnett and the great 6666 Ranch. In fact, by 1880 the lands which Marcy had described in 1849 as covered with "groves of mezquite timber [and] a beautiful carpet of rich grama grass . . ." (United States 1850:211) were so filled with cattle that stockmen formed an association to better organize the seasonal roundups of their vast herds (Williams 1954:50, 52-53, 55-56).

Today, the area remains something of a stockman's paradise, and most of the landscape surveyed in 1981 is dominated by a handful of large ranches. The droughts and depressions of the early twentieth century brought changes in ownership and the division of some large holdings such as those of the Pursley family along Croton Creek, but other ranching interests such as the Springers, Pattersons and Burnetts have maintained possession of their land for almost a century.

COMANCHES IN THE CROTON BREAKS:  
EARLY ETHNOGRAPHIC ACCOUNTS

A cursory glance at the geographical setting of the survey area and a familiarity with the water situation there would suggest that exploration and settlement along the Croton Breaks occurred later than in other parts of the state. Almost equally distant from more settled areas in the Spanish Southwest, it would seem that exploration of the area would have been delayed until well into the nineteenth century.

Such was not the case, however. Interest in opening trade between Santa Fe and San Antonio de Bexar, between Chihuahua and St. Louis, and between the Comanche Indians of the upper Brazos and Hispanic populations in New Mexico spurred early and relatively intense activity throughout the survey area by the last quarter of the eighteenth century. While his own notations about topography are so sketchy that it is impossible to define a particular route, it is generally accepted that Pedro Vial's pioneering trip from Bexar to Santa Fe in 1787 led him across the North Texas and Panhandle areas (Loomis and Nasatir 1967:xvi, 262-287).

Vial was followed within a year by Jose Mares who had been commissioned by Fernando de la Concha, governor of New Mexico, to find a more direct route between Santa Fe and San Antonio. His trip into Texas took him to Spanish Fort and then south, but his return to Santa Fe may very well have taken him to the vicinity of the survey area. Loomis and Nasatir (1967:311-312) speculate that Mares was on the Double Mountain Fork of the Brazos on March 16, 1788, and then, on the seventeenth, on a river he called the Rio Salada which was surrounded by red cliffs and sandy ground and was "so salty that the animals could not drink it." A day later, he described an area which sounds much like the Croton Breaks between Aspermont and Guthrie where it is cut by Salt Croton Creek, and where a large salt flat lies within the southern portion of the present-day Martin-Springer Ranch:



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On the 18th I marched to the north through a passageway with many low hills, mesas, and very sheer arroyos which I was able to traverse with difficulty. I crossed another salty river [Salt Croton?] in which the animals were not able to drink. I stopped on the same river where there is a fine salt [deposit]. I named it Las Salinas de Mi Senora de la Luz; the plains [are] bad; the course [of the river] is to the east (Loomis and Nasatir 1967:312).

While Mares did not mention encounters with Indians in the vicinity of the salty rivers, he met bands of Comanches within days of leaving the area and traveling north. In addition, eyewitnesses during the first half of the nineteenth century clearly placed the Comanche in and around the upper reaches of the Salt Fork of the Brazos River, an area located squarely in the middle of the traditional Comanche range.

Richardson (1933:47) and Wallace and Hoebel (1952:12-13, 26) note that Anglo-Americans and Spaniards first learned about the Comanche Indians in the early eighteenth century when they lived in present-day Colorado and western Kansas. Shoshonean-speaking people who had been driven from southern Wyoming by Sioux and other neighboring tribes, the Comanches continued to move southward until well into the nineteenth century. By about 1840 their territory reached from the great bend of the Arkansas and mouth of the Purgatory south to Austin, Texas. Wallace and Hoebel describe their range as lying west of the ninety-eighth meridian and measuring more than 600 miles from north to south and 400 miles from east to west. The group identified as the middle Comanches ranged generally from the headwaters of the Red River about 100 miles south to the headwaters of the Main, Double Mountain, and Clear, Salt and Middle forks of the Brazos River. A favored Comanchean stronghold was in the breaks of the Pease River country located northwest of the survey area in present-day Motley County.

Until the 1870s, when a series of Anglo military expeditions resulted in their confinement to reservations, the Comanches were an intensely migratory people whose livelihoods were largely dependent on ready supplies of buffalo and horses. Their dress was made mostly of buffalo skins, and while everyday appearances might have been drab, war and raiding parties were usually colorful or even gaudy.

Bison was not only the main source of food for the Comanches, but their primary source of material for shelter as well. Tipis which were so ideal for their nomadic way of life were made of tanned buffalo hides and stood approximately 12 to 14 feet high. They were resistant to bad weather, and fires in the center of the tipis were used for warmth as well as cooking. Ethnographic studies and first-hand accounts note that preferred sites for camps were usually located near running water where tipis might be assembled or where temporary brush enclosures were constructed.

An unusually large number of descriptions of Comanches in and near the survey area exists because of the strategic location of the Croton

Breaks and upper Brazos River valley. After 1820, ever-increasing numbers of Spanish and Anglo-American adventurers began to cross this range--Comancheros who traded with various bands, solitary travelers from Santa Fe, caravans from Mexico to Missouri, surveyors for the United States Army, and finally the military expeditions which sounded the death-knell for Comanche activities. With each passing decade new trails were established and the Comanche range became further fragmented.

One of the first eyewitness accounts of the Comanche Indians on the Salt Fork of the Brazos and the Croton Breaks was made by Albert Pike, a well-educated New Englander who arrived in New Mexico in 1831 and in 1832 joined a prominent Taos trapper and trader for the purpose of "entering and trapping the Comanche country." The group chose as its destination "the heads of Red River and the False Washita . . ." but instead traveled considerably south of that area near present-day Post, Texas, and then eastward along the Salt Fork of the Brazos where they found nothing but salty water, "an abundance of horse tracks, and marks of lodge-poles . . ." (Pike 1967:vii, 33, 55-59).

Donoghue (1935:137-138) suggests that Pike continued to follow the Salt Fork, but some sources point to another route. George Wilkins Kendall's map of ca. 1841 (Fig. 30) which accompanied his narrative of the Texan Santa Fe Expedition traced Pike's trail and suggested that he followed the Salt Fork along the contours of the big bend just north of Double Mountain, after which he struck out east across present-day U.S. Highway 83 in northern Stonewall County. He may have intersected Pen Branch, or perhaps North Croton Creek, a conclusion also made by David Weber, editor of Pike's account (Kendall 1929:folding map; Pike 1967: 61). Certainly, Pike's own narrative tended to support this route when he wrote that on the morning of October 15, 1832, the group left the Salt Fork and traveled on a high prairie to the east. They encountered an abrupt canyon where they stopped at a "large clear limestone [sic] spring of water" (possibly site 41SN71, Fig. 31a). From the spring, they traveled northeast down the valley (Wedington Canyon?), crossing the hollow some 40 times. Pike noted that the valley was "full of horse-tracks and signs of Indians" but that the party had been unable to resist the temptation of shooting at the large catfish living under the shelving rocks.

Eventually, they left the freshwater stream, turning to the east and noting a "high and conspicuous conical hill to the right" (Kiowa Peak?). They then passed "an old enclosure which had been built by the Comanches, of brush, and a circle surrounded with converging poles, which reminded [Pike] of the threshing floors of the New Mexicans." They passed through mesquite in a floodplain and intersected a river which contained extremely salty water (North Croton Creek?) (Pike 1967: 60-61).

Pike's was very likely one of the first forays into the survey area, and it remained the only one for which good records exist for almost twenty years. Then, in the fall of 1849, Captain Randolph B. Marcy, charged with laying out a route from Fort Smith to Santa Fe,

## PART 2: HISTORIC RESOURCES

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described the fertile and grassy plains in the vicinity of Double Mountain as well as his encounter with a group of five Comanche Indians and a party of some one hundred Kickapoo warriors who were on their way with their families to the Colorado River where they planned to spend the winter hunting (United States 1850:211, 214-215, 217).

Marcy's 1849 trip brought him no closer to the survey area than the Salt and Double Mountain forks of the Brazos River, but in mid-1854 he returned to the upper Brazos with Indian agent Robert Simpson Neighbors. Neighbors and Marcy had been charged with the task of selecting lands for an Indian reservation, and so on July 12 the two men met at Fort Belknap and proceeded in the direction of the upper Brazos River valley (Neighbors 1975:110, 132-134) (Fig. 32).

Marcy's report on the expedition suggests that he and Neighbors traveled westwardly along the South Wichita River, dropped south to Mustang Creek just east of Buzzard Peak in present-day King County, and then moved generally south to the vicinity of the proposed Dam Site 19 basin on North Croton Creek: "Our route lay in the direction of one of the most prominent peaks of the chain [of mountains], which was a very perfect cone, and apparently symmetrical upon all sides [Kiowa Peak?] . . . ."

On the 1st of August we continued towards the conical peak of the mountains for twelve miles, when we struck another branch of the Brazos, which was spread out over a broad bed of loose sand that absorbs most of the water [North Croton?]. We followed up the north bank of this for a few miles, when we encountered still another tributary [Pen Branch?], of an entirely different appearance. It was shut in by high, abrupt clay banks, the water clear, deep, and covered with water grasses, very much like one of our northern spring brooks, and I felt the utmost confidence that we should find the water fresh, but it proved to be, if possible, worse than that in the other branches.

It was literally alive with a multitude of large cat and Buffalo fish, several of which we caught and cooked for our dinner, and can vouch for their good flavor (United States 1855:11-12; Neighbors 1975: 116-117).

The similarity of Marcy's descriptions to those of Pike some 20 years earlier suggests that portions of their routes were the same, especially those mentioning the Brazos drainage which may have been North Croton Creek, and the "high and conspicuous conical hill" that may have been Kiowa Peak.

Marcy and Neighbors, who concluded their trip by proceeding south to Flat Top Mountain and then heading back east (Neighbors 1975:116-117), were two of the first official representatives of the State of

Figure 30

# BRAZOS NATURAL SALT POLLUTION PROJECT

## SELECTED NINETEENTH-CENTURY ROUTES

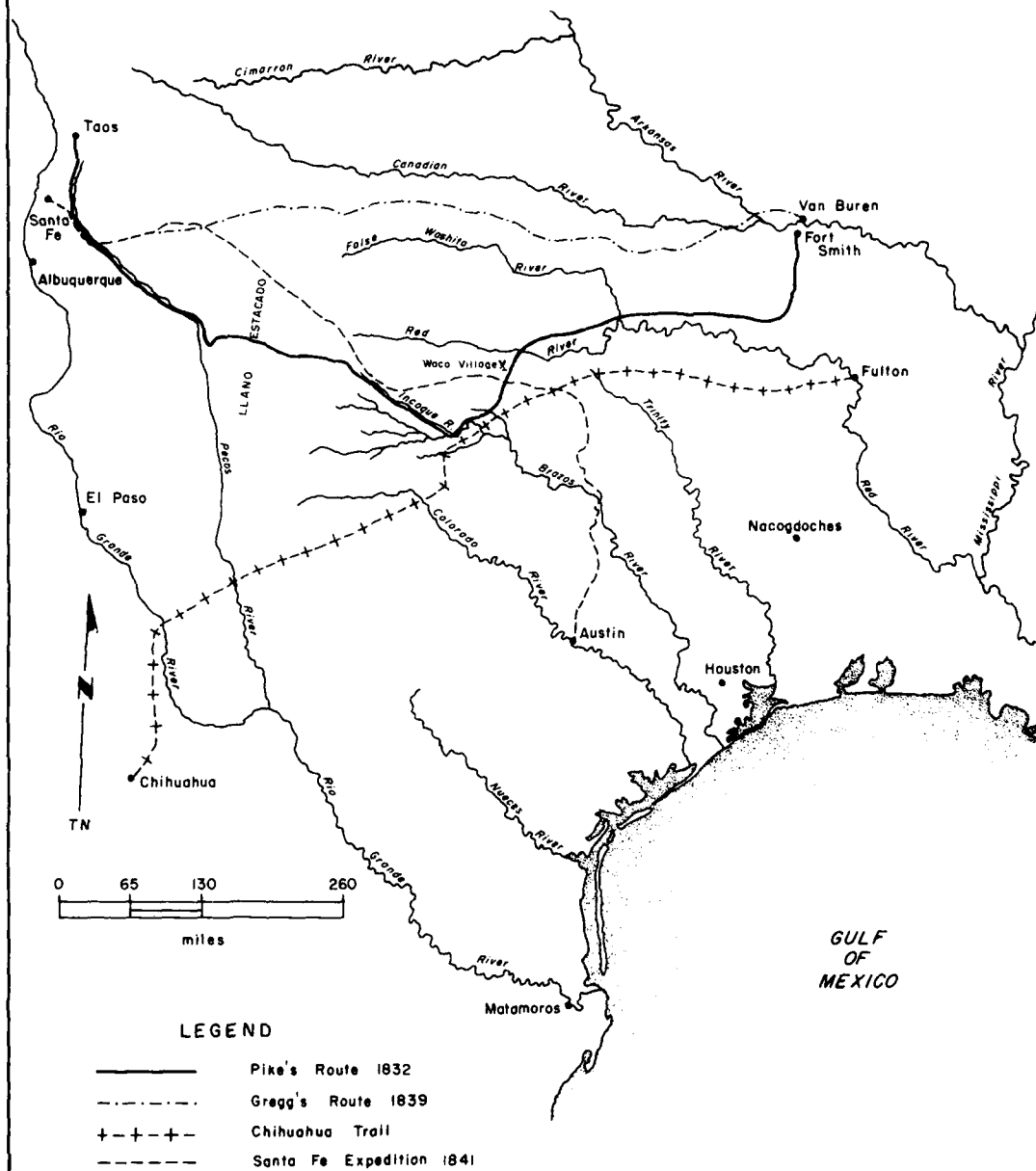


Figure 31. Wedington Spring and Kiowa Peak Copper Mine

a. A view to the southwest shows a freshwater spring in Wedington Canyon on the margin of the Dam Site 19 basin which has been a perennial cattle camp for almost a century. Documentary sources suggest that this spring, site 41SN71, or another one like it down canyon may have been used by the famous southwestern explorer Albert Pike in 1832.

b. A view east-southeast of site 41SN73, the Kiowa Peak Copper Mine. While this site seems to date from the early twentieth century, interest in the mineral resources of the Kiowa Peak area in northern Stonewall County began in the 1870s when representatives of the Washington Land and Copper Mining Company visited the vicinity and located claims in a dozen sections. The machinery at 41SN73 was eventually dismantled and moved to Aspermont, where it was reassembled and displayed on the courthouse lawn for a number of years.

Figure 31



*a*



*b*

## PART 2: HISTORIC RESOURCES

Texas to view the country of the upper Brazos River near the Salt Fork. However, they were followed within 15 years by ever-increasing numbers of military personnel who not only built forts in and near the Comanche range, but were charged with the responsibility of subduing renegade bands and encouraging them to return to the reservation.

The officer primarily charged with this detail was General Ranald Slidell Mackenzie, a brilliant tactician who graduated first in his class from the United States Military Academy, entered the Civil War as a second lieutenant and left a brigadier general three years later, and commanded a number of Texas frontier posts. His most important commission, to remove hostile Indians from Texas, began in August of 1871 and lasted five years with campaigns on the Llano Estacado and in various canyons in the Texas Panhandle. The Battle of Palo Duro Canyon, one of the last major Indian fights in Texas, was led by Mackenzie on September 28, 1874, but he continued to initiate forays against the Comanches for another two years.

One of Mackenzie's earliest campaigns occurred in the fall of 1871 when the Fourth U.S. Cavalry moved westward out of Fort Griffin, crossed California Creek and Double Mountain Fork of the Brazos, and camped near Flat Top Mountain and Cottonwood Springs from which Double Mountain was clearly visible (Carter 1935:ix, 159-160). From Flat Top, they proceeded generally west to the Salt Fork of the Brazos, passing north of Double Mountain and south of the breaks of Croton Creek, probably in the vicinity of present-day U.S. Highway 380. A map of Mackenzie's trail drafted by an engineer officer of the eleventh infantry (Fig. 33) indicates that the route passed the vicinity of present-day Jayton and that the troop then camped on the east bank of Duck Creek near its confluence with the Salt Fork, an area which maps of the early 1980s identify as the site of "Pepper's Rancho." Captain R. G. Carter, who accompanied the command, described the trail as having gone through rolling prairie thinly covered with mesquite and thickly covered with prairie dog towns and immense herds of buffalo as far as the eye could see. In particular, he noted evidence that others had preceded the cavalry:

We discovered this day the trading stations of the Mexicans [Comancheros?] with the Indians, consisting of curiously built caves in the high banks of bluffs, the earth being propped up or kept in place by a framework of poles . . . . These trading stations were now abandoned (Carter 1935:161).

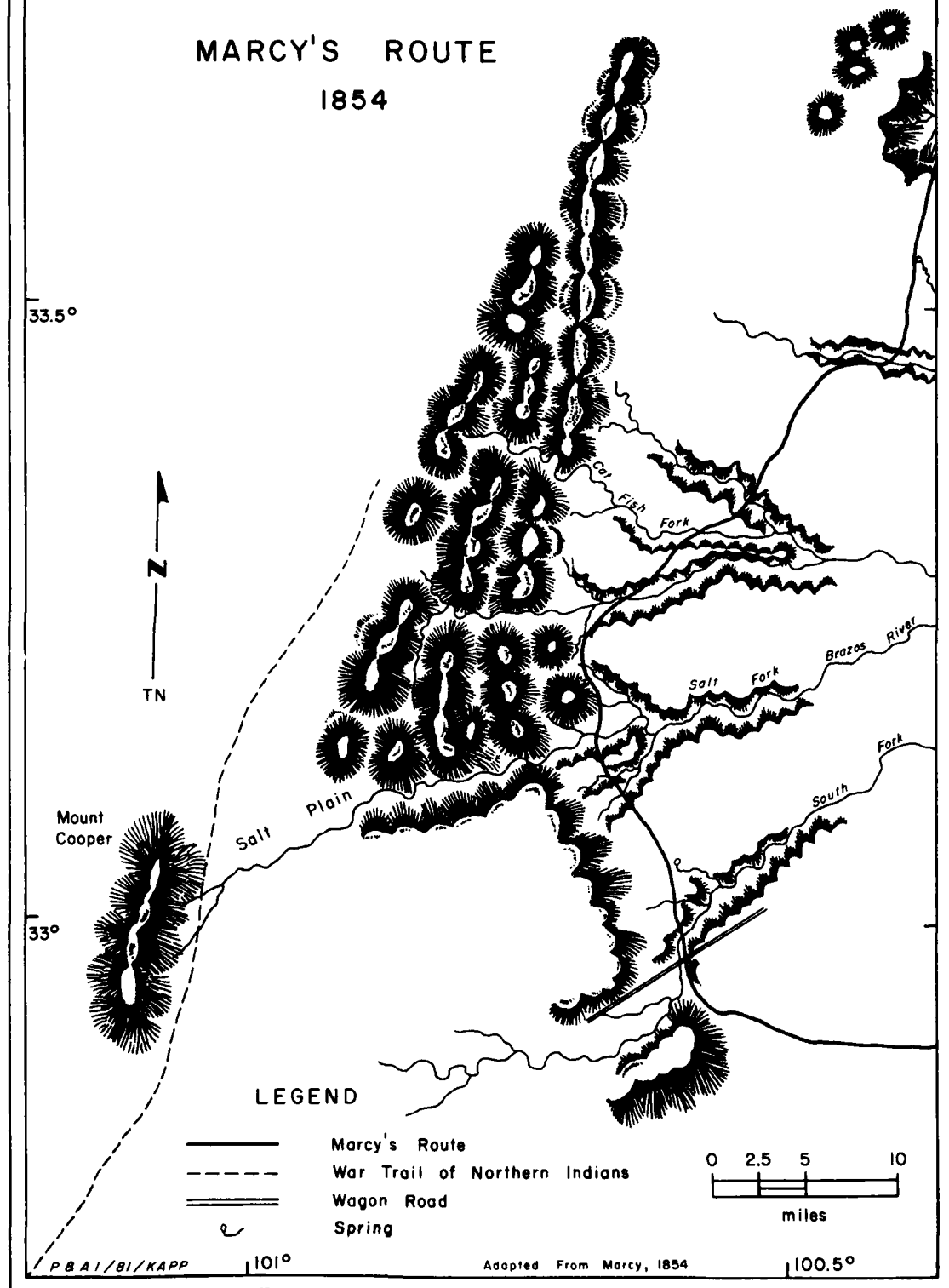
Duck Creek, Jayton and the plain south of Croton Creek continued to be the scene of military activity for at least another five years, but it is unlikely that Mackenzie or his troops ever explored the breaks to the north and northeast in the vicinity of the project area. In addition, the Comanches whom Mackenzie pursued so assiduously had secluded themselves in the fastnesses of the Pease River breaks and canyons such as Palo Duro and Blanco. Only a decade before, they might have followed the same vast buffalo herds which drew Carter's attention, but in the 1870s other pressures kept them from the area as soldiers, buffalo

Figure 32

# BRAZOS NATURAL SALT POLLUTION PROJECT

## MARCY'S ROUTE

1854





## PART 2: HISTORIC RESOURCES

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hunters, surveyors and miners began to crowd onto the upper reaches of the Salt and Double Mountain forks of the Brazos River.

### EXPLOITATION: BUFFALO HUNTERS AND MINERS

The resource which initially brought Anglo-American entrepreneurs onto the grassy plains of the Salt Fork was buffalo, and during the "Great Kill" of the 1870s, literally millions of animals were slaughtered by hunters who set up camps near Double Mountain, Rath City to the southeast, and various areas in the Croton Breaks (Fig. 34). An international demand for hides resulted in the decimation of the herds by outfits such as those of Carr and Causey, Goff, and Quinn, so that by 1880 the buffalo were all but gone.

One of the best accounts of the "Great Kill" was left by a man who participated in it from a series of camps he had set up in the Croton Breaks. John R. Cook, born in Ohio in 1844, and temporarily a resident of Santa Fe, became involved in buffalo hunting in early 1875 until April of that year. His first camp was located in the gypsum region along the breaks of the Croton within plain view of Kiowa Peak to the east and Double Mountain to the south, and in three months Cook and his five partners killed some 3,361 animals. Further south, on the plains near the Salt Fork, Cook remarked on herds of buffalo that were so enormous he could only describe them as a "vast sea of animals . . ." (Cook 1967:3, 161-167).

Croton Creek appears to have been a favorite camping area for many of the buffalo hunters who congregated along the Brazos in 1875. Cook noted that outfits near his own included that of Carr and Causey, which killed 3,700 animals; John Goff (about 6 miles northwest of the Mackenzie Trail); and the Quinn Brothers south of Croton where Mr. Hickey, a hide-buyer from Leavenworth, Kansas, bought some 12,000 hides of animals killed by the Quinns and other outfits during the winter (Cook 1967:178-180, 182, 192, 193).

The peak of the hunting activity occurred in 1875-1877, and Cook observed that by early 1878, a herd of 50 buffalo was a rarity (1967:291). However, hunters continued to kill even those remnants, as well as other forms of game. Ella Elgan Bird [Dumont], who came to the Wichita breaks in about 1880, went with her husband and a Mr. McSwain on a hunting trip on Double Mountain Fork and Croton Creek.

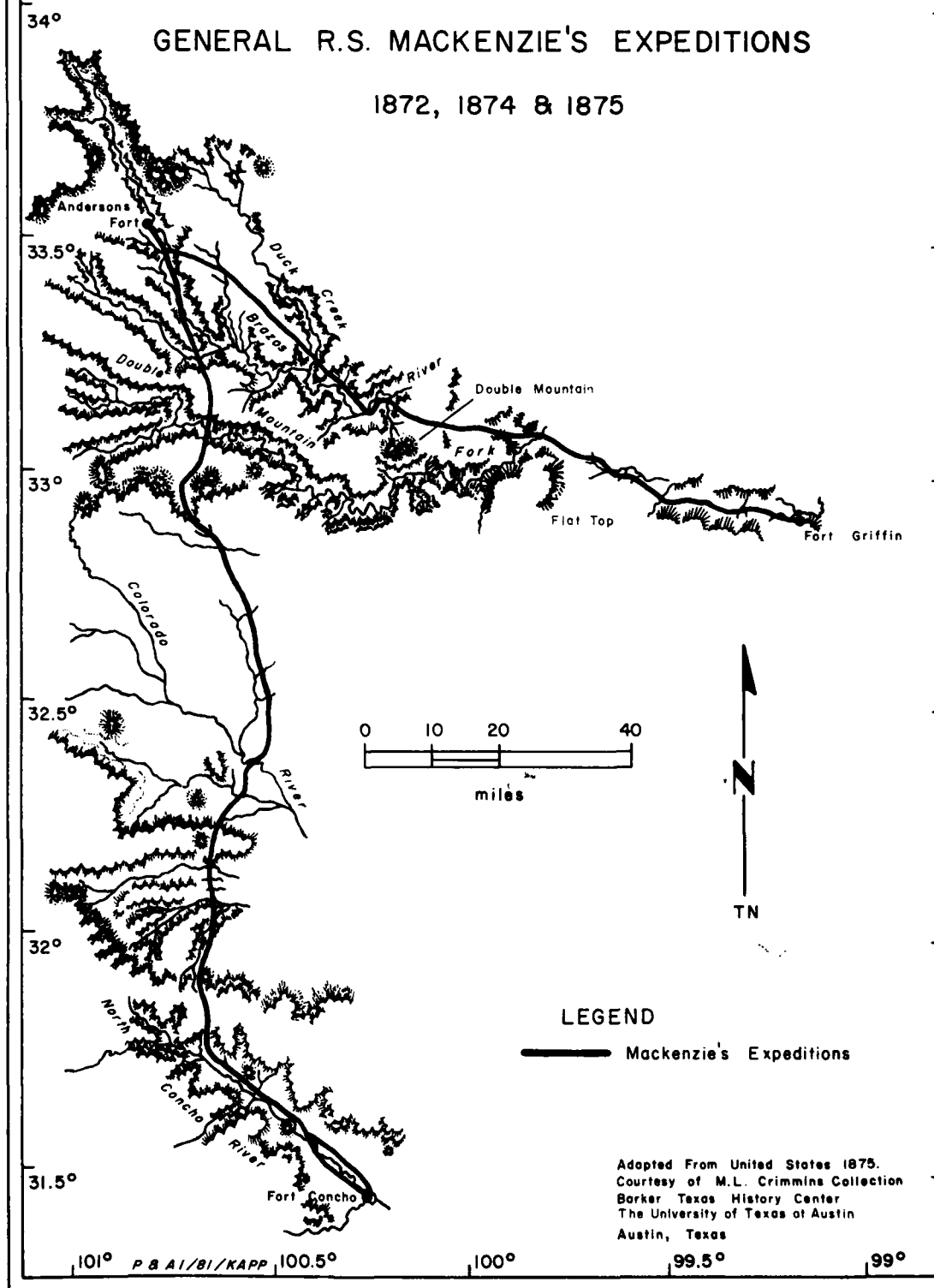
The buffalo were now about all gone, so they turned their attention to smaller game, antelope, deer, wolves, and other small game for the hides. They had gotten quite a collection of hides. They could dress those and get a good price for them. We camped several days in different parts of the country. The men were out hunting all day leaving me in camp alone. I did much carving in the gyp rock . . . .

Figure 33

# BRAZOS NATURAL SALT POLLUTION PROJECT

GENERAL R.S. MACKENZIE'S EXPEDITIONS

1872, 1874 & 1875



## PART 2: HISTORIC RESOURCES

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Figure 34. Site 41KG61, Possible Buffalo Hunters' Camp and Grave

a. A view generally south towards Haystack Creek, a tributary of Salt Croton Creek in the Dam Site 14 basin, showing the portion of site 41KG61 which local informants identify as a buffalo hunters' camp. Such camps proliferated in the 1870s, when hunters flocked to the vicinity of the Salt Fork to decimate more than one million bison in a few short years.

b. A view toward Haystack Creek, facing west-southwest, illustrates a concentration of stones identified as a buffalo hunter's grave by local informants. The feature may alternatively represent a portion of the rock enclosure associated with the camp.

Figure 34



*a*



*b*

## PART 2: HISTORIC RESOURCES

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I would walk two or three hours over the hills up and down the canyons, gathering fancy specimen of rock and other curios (Dumont 1964:160-161).

Ella Bird was not the only person in the Croton Breaks who was interested in "gathering fancy specimen of rock," nor were buffalo hunters the only entrepreneurs interested in exploiting the natural resources of the upper Brazos River. As early as 1774 Athanase de Mezieres reported that the Spanish had gone to search for mines on the Brazos de Dios, and in 1823 Daniel Shipman and two other men ventured out from Austin's Colony to search for a silver mine on the Brazos. During the 1830s and 1840s, other writers reported mountains of iron and large "lump[s] of patina" near the Brazos, while the Telegraph and Texas Register in Houston urged prospectors to go up the Brazos to copper deposits which the paper noted were "laid down on all old Spanish maps." In the late 1860s, three expeditions left Parker County to search for copper on the Brazos and some found favorable signs on the Wichita (Dobie 1931:356).

At least one group of adventurers took the legends seriously enough to organize a company and form an expedition which ventured into the survey area. In the summer of 1872, a group called The Washington Land and Copper Mining Company (Dobie called it the Washington and Texas Land and Copper Company, 1931:280) assembled at Fort Richardson and camped directly at the rear of the post. Comprised of individuals mostly from Washington, D.C. and Baltimore, a more eccentric group of people could not be imagined. As Carter expressed it (1935:333), "perhaps there had never been seen in that section of Texas in one small crowd so many unique characters." Head of the expedition was a Mr. Chandler of Norfolk, Virginia, who had been an ante-bellum member of Congress. Accompanying him was watercolor artist, Mr. Kellogg, an Oriental traveler and author of several books on Egypt and the Holy Land. Then came Professor Roessler, State Geologist of Texas, who Carter described as a "crank;" a photographer; a commissary who later became speaker of the New Jersey legislature; and a four-and-one-half-foot-high chemist who "had never seen the insect and animal life of Texas," had "immense jars of alcohol," and responded to each tarantula, centipede, scorpion, lizard and horned toad brought him with the words, "'How pe-c-o-o-liar!'" Other members of the expedition to Kiowa Peak included a Hungarian count, and the titular leader, Colonel McCarty, who was described as a "bare-faced fraud and humbug." McCarty had been involved in a diamond robbery and elopement, and told the assembled party that he was a nephew of Barbara Fritchie, a Civil War heroine (Carter 1935:333-335).

In June of 1872, the assembled company left Fort Richardson, made its way to Fort Belknap, proceeded to Kiowa Peak where they located 12 sections of land, and then returned to Fort Griffin. At Fort Richardson they disbanded. The break-up of the group was accompanied by a degree of tension since Colonel McCarty was rumored to have salted the area with ore specimens acquired in Austin, and Satterlee C. Plummer, a member of the accompanying cavalry, challenged McCarty to a duel as a result (Carter 1935:335).

McCarty may have salted the 1872 claim, but there was no doubt that copper did indeed exist in the vicinity of Kiowa Peak. General George B. McClellan noted copper deposits south of Kiowa Peak in 1877 (Ewing 1954:22-23), and a survey of a portion of Smelter Canyon in 1981 revealed the remains of copper mining in the form of mine tailings, copper sulfate fragments and miscellaneous historic artifacts such as lumber associated with mining activities (site 41SN73; Fig. 31b).

## EXPLOITATION: CATTLEMEN IN THE CROTON BREAKS

The activities of capitalists interested in striking it rich by locating mineral deposits had a negligible impact on the survey area in the nineteenth century. On the other hand, the campaigns against Comanche and buffalo waged during the 1870s had a profound effect. Only a foolhardy soul would have attempted to settle on the Salt Fork of the Brazos while the area was in the grip of hostile Indians. Thus, the elimination of Indians and buffalo from the breaks and plains east of the Llano Estacado was essential to permanent settlement, a fact which was not lost on the likes of General Phil Sheridan who addressed a joint session of the Texas Legislature and urged lawmakers not to pass a bill protecting the buffalo. Buffalo hunters, he pointed out, had done more to settle the Indian problem than the activities of the regular army in the past several decades (Rathjen 1973:174-175).

The physical absence of a "sea of buffalo" also cleared the way for the economic exploitation of the plains by freeing up range for the use of cattle. As a result, stockmen from areas further east on the Brazos trailed their herds up the river and soon laid claim to virtually every bit of free grass on the open plains around Double Mountain and north into the Croton Breaks where the alkaline water, if not particularly palatable, was usable for stock purposes.

An absence of Comanches and buffalo made the survey area attractive to cattlemen in the late nineteenth century. But another factor played an equally large part in the success of ranching on the Salt Fork. The simple fact was that the land, although it had been mostly granted by the 1860s and 1870s, was available. Within the survey area alone, more than 60 percent of all land was owned by three railroad companies--the Houston and Texas Central; the Buffalo Bayou, Brazos, and Colorado; and the Galveston, Houston, and Henderson--all of which were formed, owned and managed by businessmen living far from the Salt Fork. To cattlemen, then, the land was the next best thing to unclaimed range, and leases were to be had for the asking. Agreements such as that between the Houston and Texas Central Railway Company and D. H. and J. W. Snyder & Company of Williamson County, Texas, and Laramie, Wyoming, had become common by 1884 when the Snyders' leases totaled some 280,320 acres of railroad land on the waters of the Salt Fork (Stonewall County Deed Record IC:166-176). Indeed, a look at appropriate Assessor's Abstracts revealed that, within the survey area, the railroads generally chose to lease their land to cattlemen, and retained actual ownership of the property until the first decade of the twentieth century.

## PART 2: HISTORIC RESOURCES

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The Snyders were among the biggest operators along the Salt Fork, but a number of other prominent ranchers ran cattle within the survey area as well. In the vicinity of the proposed Dam Site 10 reservoir basin in northeastern Kent and northwestern Stonewall counties, the stockman with the largest range and biggest herds was Jesse Hittson, who had started the Two Circle Bar brand in Palo Pinto County in 1874, and moved his herds to Double Mountain in about 1879. By 1880 the census noted three ranches or line camps housing his hands, one of which was located between the Salt Fork of the Brazos and the present Patterson Ranch Headquarters (United States 1880:Stonewall and Kent counties; Williams 1954:53; Nuding 1981). Hittson's cattle roamed from Double Mountain into the Croton Breaks, a pattern which persisted after Hittson sold his brand and herds to a Scotsman, O. J. Wiren. By 1886, Wiren had some 30,000 head grazing on 500 or more square miles, and later ownership of the ranch by Kellogg, McKay and Runnery; Clark and Cravin; and after 1900, Wishard and Bilby, saw little change in the extent of the original Two Circle Bar range (Williams 1954:53-54).

To the northeast, in the vicinity of the Dam Site 19 basin, at least four big operators were utilizing the range by 1890. One of the earliest of these was Mark Lynn of Palo Pinto County who moved his 8,000 cattle branded LIL to Kiowa Peak and headquartered at the mouth of Big (North) Croton Creek (Williams 1954:50; Stonewall County Historical Commission 1979:8). Nearby, on the north bank of North Croton Creek was a line camp dugout (41SN72) (Fig. 35) belonging to W. H. Portwood who later became one of the biggest beef producers in the Seymour area, and a man named Halsell of Wise County, who was in partnership with William T. Waggoner in 1883 when they bought a section on the west bank of the Salt Fork of the Brazos (Williams 1954:21; Bradley 1981; Stonewall County Deed Record 2:128-129).

West of Lynn, Portwood and Halsell were two companies who were operating on the upper reaches of North Croton Creek by 1884. The Moyne Land and Cattle Company owned a number of sections along North Croton and Big Buffalo creeks, and eventually sold out to the Louisville Land and Cattle Company in 1889 which, in turn, sold to Burk Burnett and the 6666's around the turn of the century. To the south, along North Croton Creek and Pen Branch, the Rayner Cattle Company, also known as the Call Bar, owned some land and leased the balance from the Houston and Texas Central Railroad Company in the 1880s. Eventually, portions of the Call Bar in King and Stonewall counties were purchased by the Parramores and the Mayfields. Headquarters of Rayner's Call Bar may have been north of Ballard Pouroff in the vicinity of 41KG63, a site which seems to have been located on one of the only sections which Rayner actually purchased from the Railroad Company (King County, Assessor's Abstracts; Stonewall County, Assessor's Abstracts; Williams 1954:50; Stonewall County Historical Commission 1979:8, 199).

Ranches such as the LIL and Call Bar did not survive in their original forms much past 1900 because they were run by cattlemen who had leased railroad land instead of purchasing it outright. As a result, the decision by the railroads to sell their holdings in the Croton Breaks after 1900 made it possible for an entirely new group of ranches

to develop in the survey area. Some of these were owned by families who had come to the upper Brazos River valley in the 1880s, but a number were developed by men who did not come to Kent, King and Stonewall counties until after 1890. As a result, the twentieth-century ranching landscape of the survey area was comprised of a mixture of enormous ranches put together by men who had been in the area for a number of years and had bought out older ranches, and a number of small-to-medium-sized ranches slowly acquired after 1900.

In the vicinity of the proposed Dam Site 10 basin along Croton Creek, three ranches in particular stood out because of their size and/or the longevity of their operation. The first, on the eastern end of the reservoir basin, was put together by a man who bridged the era when land along the Salt Fork of the Brazos was open range, and the period when ranchers began to fence their land. Jefferson Davis Patterson, one-time outside man for the Two Circle Bar Ranch at Double Mountain, grew up in Hays County near San Marcos in a large family from Joplin, Missouri. He helped his father, Greenup B. Patterson, raise cotton, but must have decided that cattle raising had more allure. In 1887, he trailed a small herd north and then, as family tradition recounts, traded a saddle horse for a section of land in Stonewall County about 2 miles east of the Kent County line. He took shelter in a dugout built in 1885 in Seven Diamond L Canyon by a family named Lanier. He laid claim to two more sections after 1888, and went to work for the Two Circle Bar Ranch, the cattle of which ranged in the vicinity of Croton Creek.

In 1889, Patterson married Mittie Lea Ward of Haskell, Texas, and the newlyweds bought one of the Two Circle Bar three-room, frame, line camp houses. Eventually, the family moved the house to the vicinity of the present Patterson Ranch Headquarters, between the headquarters and the Salt Fork.

A new headquarters was begun in 1901, a year after the birth of J. D. Patterson, Jr. Possession of that impressive structure and of the surrounding property remains today with the Patterson family, whose ranch is the location of a combination of sites dating from the open-range days and sections of land acquired from the Houston and Texas Central Railroad Company after 1900 and from neighboring ranchers such as Jim Q. Ward, who sold out around World War I (Stonewall County Historical Commission 1979:251; Patterson 1981; Nuding 1981).

Up Croton Creek from the Pattersons and adjoining their land on the west were a number of sections belonging to the Murdoch family between 1890 and World War I. The first member of the family to come to the Salt Fork was Thomas Elliott Murdoch, who was born in England, came to Galveston and lived with relatives who had acquired property in Matagorda County. Soon after, Murdoch moved to Mason, where he married Eva Edwards from around Cuero and worked for Bob Goodall. Probably as a result of the famous Goodall-Faulkner feud (a notorious Mason County family feud), Murdoch scouted the Croton Creek area on behalf of himself and his employer. According to a son, the Murdochs moved permanently to



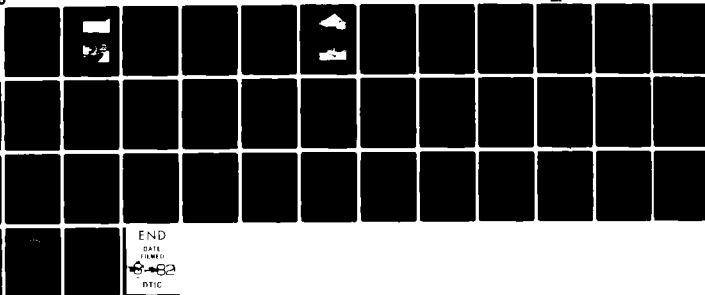
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A PRELIMINARY ASSESSMENT OF THE CULTURAL RESOURCES IN THE BRAZOS--ETC(U)  
NOV 81 J P THURMOND, M D FREEMAN, S L ANDREWS DACW63-81-C-0095

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## PART 2: HISTORIC RESOURCES

Figure 35. The Portwood-Halsell Dugout

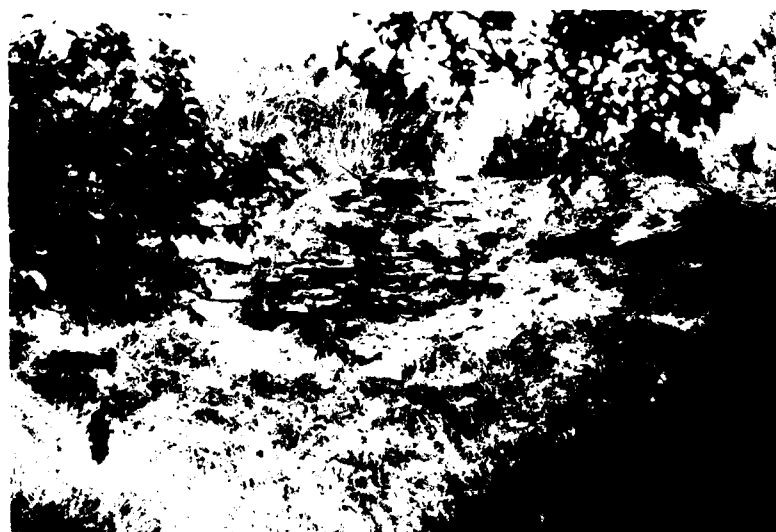
a. A view southwest across the North Croton Creek valley towards its confluence with Wedington Creek, which enters from behind the high ridge at left of center. The Portwood-Halsell Dugout, site 41SN72, is not visible in this photograph but lies near its center. The surrounding valley was once rich grazing land but has deteriorated through overuse to a dense growth of woody shrubs and unpalatable forbs. Randolph B. Marcy's expedition may have passed up the valley in this vicinity in 1854.

b. A closer view of site 41SN72, facing west. The structure is a typical dugout, probably dating from the last quarter of the nineteenth century, and is well sheltered with easy access to water in the stream to the immediate east. The roof has collapsed, but a portion of a stone fireplace is clearly visible at the rear wall of the structure.

Figure 35



*a*



*b*

## PART 2: HISTORIC RESOURCES

Kent County in the 1890s, bringing a herd of sheep with them and settling in a dugout in Cottonwood Canyon. They eventually moved from the dugout to a one-room gyp rock house down canyon and raised sheep for nine years before selling out to a man named Horn. From that point on, the family raised cattle, registering brands in Jayton in 1901 and 1908.

Concurrently, Tom Murdoch purchased sections along Croton Creek whenever they became available. However, in 1914 he was persuaded by his family in Matagorda County to sell everything but a section in Cottonwood Canyon and return to southeast Texas.

Murdoch's absence from Kent County was of short duration. In 1917-1918 he returned to the Croton Creek valley, where descendants still live on a bluff overlooking the Creek. But the landscape had changed. Across the Creek, Melton S. Sandell built a frame house (41KT20; Fig. 36a) to which he moved his family after his bank in Jayton failed. Much of the rest of the property along Croton Creek had been bought by the Pursley family, whose holdings eventually ran from east of Panther Canyon upstream to just below the Dickens-Kent County line (Murdoch 1981; Black 1981; Kent County Marks and Brands Record I).

The Pursleys, who were Murdoch's neighbors, were relative late-comers to Kent County, but they still managed to acquire one of the largest ranches on Croton Creek and to become related by marriage to some of northern Kent County's earliest settlers. One branch of the family was comprised of George Washington McLain and Prudence Ann Trammell McLain who raised stock in Navarro County, Texas, until they decided to visit Mrs. McLain's brother, Tom Trammell, owner of a large ranch south of Sweetwater in about 1890. The McLains apparently liked the area, for they opened a general store near Double Mountain. At the same time, McLain worked for the Two Circle Bar, putting up the outfit's first fence.

On December 9, 1895, in the county seat of Clairemont, one of the McLain daughters, Georgia Gertrude, married G. A. (Barry) Pursley who was born in Arkansas, lived for a time in or near Corsicana, Texas, and then accompanied his brother, W. M., and father, George P., to Kent County, where they arrived in the 1890s. As early as February 1895, George and Barry had registered a cattle brand in the clerk's office of the Kent County Courthouse.

The Pursleys may have owned land elsewhere in Kent County in the 1890s, but by 1896 the clan had moved to 160 acres on Croton Creek, on which George Pursley filed a claim in January 1897. They built a small frame house there on the north end of a field which they later put into cotton, and subsequently built two other houses nearby. On the west side of Croton Creek, Barry and Gertrude lived in a small frame house which is still marked by a cistern (41KT28); and on the east side, just north of the first housesite, they built a seven or eight-room frame house of lumber hauled from Sweetwater and erected on stone footings (41KT27). The original home was moved near the newer one and used as a kennel, a not altogether unusual adaptation for people who were so

passionately interested in breeding stock of every kind that neighbors still remember the Pursley racehorses as among the best in the state.

At some point after 1900 a falling out among the Pursley men resulted in the move of G. P. and W. M. to Oklahoma. Barry and Gertrude retained possession of the Croton Creek ranch which grew steadily until World War I when tragedy hit the family and Barry was killed. Gertrude and her daughter, Thelma, attempted to hold on to the ranch, but the droughts of the 1920s followed by the Depression made it impossible for them to retain possession. A large portion of the ranch was bought by Fort Worth financier and rancher, George Beggs, II, whose descendants still own the land. Other sections were bought by the Murdochs, Sandells, Branches and Winchells (Pursley 1981; Black 1981; Baird 1960: 107-108; Kent County Marks & Brands Record 1).

If land-ownership on Croton Creek in the vicinity of the Dam Site 10 basin was a somewhat checkered affair with property changing hands and new ranches evolving out of older, large ones, the pattern on Salt Croton Creek was considerably different. In the area open to survey in the vicinity of the Dam Site 14 basin, most of the land was owned by the Martin brothers, whose descendants, the Springers, still carry on the traditions of the Bar S Ranch.

Permanent settlement along Salt Croton Creek came late in the nineteenth century, but it was preceded by earlier historic activity due largely to the existence of buffalo in the Croton Breaks and a large salt deposit in Stonewall County on Salt and Salt Flat creeks. Site 41KG61 (Fig. 34) is believed by descendants of the Martins and Springers to have been the location of a buffalo hunters' camp and of an associated grave. Other sources suggest that the use of the salt flats to the south may have occurred at an even earlier date. A Texas Historical Marker at the Kent County courthouse mentions the existence of a Confederate salt works and suggests that the works may have been located in the vicinity of the Croton Breaks. Informants interviewed in 1981 indicated that the only salt deposit which was of mineable quality and quantity lay in the southern portion of the Bar S Ranch, where individuals often came from miles around to gather the salt and cart it off in wagons for domestic and commercial use (Springer 1981, Murdoch 1981).

Most of the land along Salt Croton Creek was owned by the Houston and Texas Central Railroad Company, but a few vacant sections existed as late as 1902-1903 when George B. Martin was listed in King County records as the patentee and his brother, W. S., as the grantee. George Martin had actually lived in King County for some fifteen years before he filed on 656.25 acres in Southerland Canyon. A resident of Tarrant County, he grew up in the cattle business and came west with a herd for Bob McClesky in 1882. He located in Dickens County on Duck Creek, then worked for the Pitchfork Ranch, located on upper Croton Creek.

Some records contend that Martin filed on school land and established his headquarters in King County prior to 1891, a locality a descendant identified as site 41KG60, a collapsed dugout overlooking Southerland Canyon. Eventually, he was joined by a brother, William,

Figure 36. Standing House Architectural Types in the Project Area

a. Site 41KT20, the Sandell House, is typical of the project area. The frame structure, built in the 1920s, is simple in form and detail. Only a few late Victorian decorations on the front and back doors and on the front porch suggest the relative affluence of M. S. Sandell, a former bank president in Jayton. View facing west.

b. Despite its abundance in the Croton Breaks, stone was rarely used in dwellings. An exception is site 41KT22, the McLain House, which was also built in the 1920s. A view from the south illustrates a standing chimney and the only relatively intact wall of what was once a one-room house with a wood frame porch on the east side.

Figure 36



*a*



*b*

## PART 2: HISTORIC RESOURCES

who lived in 41KG60, and then in a house on the Bar S South Camp. William and his family later moved to a ranch closer to Aspermont, while George B. Martin and his family continued to acquire more land along Salt Croton Creek. There were sufficient freshwater springs in Haystack and Southerland canyons to offset the salinity of Salt Croton Creek, and the ranch prospered well into the 1920s. In 1926, operation of the Bar S was turned over to the Martins' son-in-law, William S. Springer, whose family still owns and runs the ranch (Springer 1981; The King County Historical Society 1976:343).

As in the Dam Site 14 basin area, the history of land-ownership along North Croton Creek in the vicinity of the Dam Site 19 basin has been remarkably stable, dominated by the activities of a handful of large ranches. The largest of these, spread out along the length of the Creek on its north side is the 6666 Ranch, a partial descendant of the Louisville Land and Cattle Company and creation of Samuel Burk Burnett. Burnett, born in Bates County, Missouri, on January 1, 1849, came from a family which had been involved in Texas ranching since the time of the Civil War. He acquired his first herd, and with it the famous 6666 brand in Denton County, in about 1867, and some seven years later trail-  
ed a herd to the Little Wichita River. His involvement in the King County lands occurred in 1900 when, attempting to offset the loss of grazing leases in Comanche-Kiowa territory, he purchased the holdings of the Louisville Land and Cattle Company, from whom he acquired scores of sections along North Croton Creek.

Other lands in the vicinity of the Dam Site 19 basin were purchased from individual patent holders such as the Mitchells, who sold approximately 640 acres to Burnett in 1917-1918. The Mitchell property had originally been patented to J. L. Parsons in the early 1900s, and the presence of three dugouts in a ridge overlooking a spring creek north of North Croton Creek (site 41KG56) as well as the traditional name of the area--Parson's Ridge--suggests that tracts such as these had been unsuccessfully homesteaded before their incorporation into the larger 6666 Ranch (King County, Assessor's Abstracts; Gibson 1981; The King County Historical Society 1976:26-30).

Today, the 6666 is an immense ranch covering much of southern King County. Few remains of sites dating from the period before the property was acquired by Burnett were located in 1981. However, the fact that North Croton Creek could have been crossed by Spanish and Anglo military expeditions during the eighteenth and nineteenth centuries, together with the use of North Croton Creek by buffalo hunters as a favored location for temporary camps in the 1870s and 1880s suggests that a number of additional historic sites may exist in the area.

West of the 6666 Ranch, Rayner's Call Bar Cattle Company operated contemporaneously with the Louisville Land and Cattle Company, and like that Company was eventually sold to other ranches. On the south, in Stonewall County, a portion of the Call Bar was acquired by Gene Mayfield, who then sold out to James Minor Alexander of the JMA Ranch. The portion of the Call Bar Ranch in King County was purchased by J. H. Parramore, originally of Gonzales County, Texas, who entered the cattle



## CONCLUSIONS AND RECOMMENDATIONS

business in 1875. A move to Runnels County in 1879 was followed by a partnership with Claiborne W. Merchant and Hugh Lewis, with whom he formed the Arizona Territory San Simon Cattle and Canal Company in 1885.

Parramore became involved in buying King County land in late 1897, when he made his initial purchase from the Rayner Cattle Company. Eventually, he acquired some 65 sections from the Call Bar Ranch and from various individuals and railroad companies. As with the 6666 Ranch, much of the original Parramore Ranch remains in the hands of descendants. Historic sites located on the Ranch include the possible Parramore headquarters (41KG63) on Pen Branch and a location at Ballard Pour-off where cowboys with the Call Bar swam and made camp (Jones and Pittcock 1981; Burfiend 1981; The King County Historical Society 1976:33).

## CONCLUSIONS AND RECOMMENDATIONS

A field survey and historic research conducted in the summer of 1981 resulted in the recording of 17 historic sites and the formulation of a number of conclusions about sites which were both recorded in 1981 or which might be recorded in the future. First, it was discovered that historical activity in the vicinity of the Croton Breaks was of a relatively early, multi-ethnic type. The Breaks, lying as they did between the Llano Estacado and Cross Timbers, were at the heart of Comancheria and because of the presence of immense buffalo herds were not only utilized intensively by aboriginal groups, but also by Spanish, Mexican and Anglo traders and explorers who were interested in making contact with the Comanches and exploiting specific natural resources. Hence, the site recorded in 1981 which seemed to be associated with the activities of buffalo hunters (41KG61) probably was only one of many such sites which might be affected by the impoundment of waters behind the proposed dams. Furthermore, the failure of the present study to identify other, earlier sites should not be considered conclusive. Documents suggest that eighteenth- and nineteenth-century expeditions crossed the survey area, and while traces of such movements might be ephemeral in terms of material culture, the possibility that they exist should not be disregarded.

The architecture of the Croton Breaks as recorded by the present study was comprised largely of sites ranging from various types of dugouts and standing structures to the former locations of such structures. Earliest Anglo-American housesites of a temporary nature were generally found to be half or whole dugouts which demonstrated the usual differences in square footage enclosed and materials used for floors, walls and roofing. More permanent housing was almost uniformly frame, constructed of wood hauled in from urban areas well outside of the Croton Breaks and erected on footings of stone (Fig. 36a). In rare instances, permanent homes were built of stone (Fig. 36b). This preference for wood, as opposed to stone, despite the abundance of the latter material and scarcity of the former, may have been expressive of the geographical origins of settlers in the Breaks, and of the persistence of certain cultural traditions.

## PART 2: HISTORIC RESOURCES

In other particulars, however, the architecture of the project area demonstrates certain characteristics which reflect specific adaptations to a difficult physical environment. In particular, the placement of houses in relation to topography appears to have been different in the Breaks from areas further east in Texas and the Deep South. Instead of building houses on elevations to take advantage of prevailing breezes, as was common in East and Central Texas, late nineteenth-century settlers in the survey area generally constructed dugouts or frame structures in ravines, canyons and sheltered valleys in an apparent effort to achieve protection from weather sweeping in off the Llano Estacado to the west. Extremes of heat were also uniformly handled by the construction of houses with high ceilings and deep, wide porches which both shaded the interiors and sheltered the multiple cisterns which were a part of every historic housesite.

The overwhelming factor of survival in the Croton Breaks was directly linked to the availability of fresh water, and so certain historic sites were recorded because they were representative of the need to develop freshwater sources. It was also assumed that such resources were so scarce in the Breaks that historic sites would axiomatically be associated with them. Hence, site 41SN71 (Fig. 34a) was recorded not only because it was a well-developed spring which had been used by nineteenth- as well as twentieth-century cattle companies and had the appropriate cattle-working facilities associated with it, but also because historical documents suggest that it might have been a spring described in an 1832 account of an expedition through the project area.

Twelve of the historic sites recorded by the present study (70.6 percent) are not felt to require additional investigations at the present time since their condition has severely deteriorated, they are of relatively recent construction (i.e., less than 50 years old), they are of an architectural type which abounds in the surrounding region, or they will not be affected by project construction. These sites are: 41KT12, 41KT22, 41KT27, 41KT28, 41KT29, 41KT30, 41KT31, 41KG43, 41KG56, 41KG60, 41KG63 and 41SN26 (Appendix I).

Further investigations are recommended for five sites (29.4 percent of the recorded historic sites): 41KT20, 41KG61, 41SN71, 41SN72 and 41SN73. Site 41KT20 is a wood frame house which is associated with several outbuildings and dates to the 1920s. The structures are of too recent construction and insufficiently remarkable architectural significance to be considered eligible for nomination to the National Register of Historic Places. However, the site represents a relatively intact example of the predominant local architecture of its period, and it is suggested that careful photographic documentation be combined with the preparation of a detailed plan of the site.

Neither does 41SN73 seem eligible for nomination to the National Register. This site of a former copper mine has been severely disturbed by erosion. However, there may still be sufficient structure to the site to permit a mapping of mining activity areas; additional documentary research to illuminate the history of the site is also suggested.

## CONCLUSIONS AND RECOMMENDATIONS

The remaining three sites recommended for further investigation may be eligible for nomination to the National Register. Site 41KG61 is the location of a possible buffalo hunters' camp and grave, perhaps dating to the 1870s. Exploratory excavations to assess the age, function and integrity of the site are recommended. Site 41SN71, Wedington Spring, has been the location of a perennial cattle camp for at least 80 years, and may have been visited by Pike in 1832. A bedrock bench to the immediate northwest of the spring offers an ideal camping spot, and exploratory excavations to test for the presence of buried cultural remains in the apparently undisturbed soil atop the bench are suggested. Finally, 41SN72 is a fairly intact dugout which has been historically documented as representing one of the earliest known ranching sites in the project area. Both exploratory excavations to clear and document the morphology of the dugout and to attempt the recovery of cultural remains dating to this early ranching period, and further documentary research into the history of the site are recommended.

APPENDIX I: Descriptions of Recorded Historic Sites

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and

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## INTRODUCTION

The following appendix presents detailed descriptions of the 17 historic archeological sites recorded during the 1981 Prewitt and Associates, Inc. investigations in the Brazos Natural Salt Pollution Control Project area in Kent, King and Stonewall counties, Texas. No historic sites were recorded during the Southern Methodist University reconnaissance (Skinner 1973). Each site description includes: (1) site designations; (2) project area context (specific reservoir basin or pipeline); (3) designation of the survey unit which incorporates the site; (4) the name of the USGS 7.5' (1:24 000-scale) quadrangle on which the site is plotted; (5) elevation in both feet and meters above Mean Sea Level; (6) site dimensions in meters; (7) a description of site location; (8) a description of the present appearance and, if known, historical connections of the site; descriptions of the (9) physiography, (10) lithology (outcropping bedrock), (11) soil, and (12) vegetation of the immediate site area; (13) a summary of the last observed condition of the site; (14) an assessment of its research potential and eligibility for nomination to the National Register of Historic Places; and (15) recommendations for the future management of the site.

The designations used as primary site references in this appendix are trinomial numbers assigned by the Texas Archeological Research Laboratory (TARL) in Austin. For those not familiar with the structure of the trinomial system, an explanation is provided in the introduction to Appendix I of Part 1 of this report. All of the sites have also been named (e.g., Martin Dugout).

Each description of site location is divided into two parts. The general location of the site within the project area is first stated for purposes of orientation; for example, "Near the center of the Dam Site 10 basin, along the middle reaches of Croton Creek." Information sufficiently specific to permit the plotting of the site on a USGS 7.5' quadrangle is then provided. For this purpose, triangulation data based on named, easily identifiable reference points which appear on the USGS maps, such as confluences of named streams, named ranch headquarters, and so forth have been used. The locations of the historic sites are illustrated in Figures 9 through 11 (Part 1, Prehistoric Resources).

Metric units are the preferred choice for statements of dimensions in this study. However, since historic Anglo structures were undoubtedly planned by their builders in feet and inches, dimensions of such structures are stated in both feet and meters in the site descriptions.

The classes of landforms used to characterize site physiography follow the classification illustrated in Figure 2 (Part 1, Prehistoric Resources). Classifications of site lithology and soil combine field observations with the results of the environmental consultants' investigations (Part 1, Appendices V and VII) and previously existing published references.

## APPENDIX I: DESCRIPTIONS OF RECORDED HISTORIC SITES

Finally, the site descriptions are arranged in alphanumeric order, by county.

### KENT COUNTY SITES

#### 41KT12 (Branch Housesite; Dam Site 10, East of Survey Unit A-10)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1817 feet/554 meters

Dimensions: 45 meters N-S by 40 meters E-W

Location: At the northern extremity of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 1.9 kilometers southeast of the confluence of Hot Springs and Croton creeks and 2 kilometers northeast of the Coker Tank outfall.

Description: The surrounding land was formerly part of the Pursley Ranch but was purchased by Mr. and Mrs. George Branch in the late 1920s. There was no house on the site at the time of that purchase, and the Branch family built a small frame structure. The house burned in the 1970s, and a trailer home has recently been placed directly atop the site of those ruins, obliterating any remains of the foundations which might have been present. There are also several outbuildings of recent origin on the site, and two railroad cars which are used for hay storage. Numerous burned china, pottery and glass fragments were observed in the vicinity of the housesite. There is also a prehistoric component at 41KT12, which is described in Part 1, Appendix I.

Physiography: On the streamward edge of the third (12-to-18-meter) fill terrace above Croton Creek.

Lithology: Mid to early Holocene terrace fill, sandy clay loam in texture.

Soil: Obaro sandy clay loam, a Typic Ustochrept.

Vegetation: Sparse cover of short grasses and prickly pear.

Condition: The original structure burned in recent times, and its foundations have been destroyed by placement of a house trailer on the same spot. The remaining structures on the site are of recent origin.

Assessment: The original frame house must be considered destroyed, and the remaining outbuildings are of much too recent construction to merit further investigation. All of the observed cultural material on the surface of the site is of mid-twentieth-century to recent origin. The information yield potential of the historic component at 41KT12 is low and is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KT20 (Sandell House; Dam Site 10, Survey Unit A-32)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1780 feet/543 meters

Dimensions: 150 meters N-S by 100 meters E-W

Location: In the midsection of the Dam Site 10 basin, along the upper reaches of Croton Creek. The site is 0.9 kilometer east-southeast of the confluence of Croton and Short Croton creeks and 1.8 kilometers east of the confluence of Cottonwood and Croton creeks.

Description: The M. S. Sandell house (Fig. 36a) was constructed in the mid-1920s by an early Kent County rancher. The house is a wood frame structure which measures approximately 28 feet (8.5 meters) north-south by 37.75 feet (11.5 meters) east-west. The second dimension includes an 8-foot (2.4-meter) wide front porch. The frame structure rests on a poured-in-place cement footing from which the adjacent soil has eroded such that the ground surface next to the footings is now substantially below grade. Original shiplap siding covers vertical boards on the exterior of the structure, and the gabled roof is covered with wood shingles. Late Victorian details such as ornate front and back doors and structural and decorative front porch columns represent an interesting attempt to give the structure a degree of "fanciness." The layout of the building, which has two front doors and is internally compartmentalized into separate living units, suggests that two families could have lived in the house. A small wood frame shed, barn and stable with an associated corral, and a cement-lined cistern surround the house.

Physiography: On a broad bedrock bench overlooking Croton Creek, 10 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Obaro fine sandy loam, classifiable as a Typic Ustochrept.

Vegetation: Moderately dense cover of mesquite, catclaw and mid grasses.

Condition: The wood of the structures is dry and weathered, many of the windows are broken, and the front porch flooring is in poor condition. With these exceptions, the site is relatively intact. Some of the furniture is still in place.

Assessment: The house and outbuildings at 41KT20 are of too recent construction and are insufficiently remarkable in architectural terms to merit nomination to the National Register of Historic Places. However,

## APPENDIX I: DESCRIPTIONS OF RECORDED HISTORIC SITES

the structures are relatively intact, are of some relevance to the local history, and should be carefully documented prior to inundation.

Recommendations: Photographs and a general plan of the structures at 41KT20 should be prepared prior to inundation of the site.

### 41KT22 (McLain House; Dam Site 10, Outside Survey Area)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1900 feet/579 meters

Dimensions: 10 meters N-S by 15 meters E-W

Location: East of the upper end of the Dam Site 10 basin, in the uplands above the middle reaches of Croton Creek. The site is 4.51 kilometers southeast of the confluence of Hot Springs and Croton creeks and 2.74 kilometers northeast of the confluence of Short Croton and Croton creeks.

Description: A stone house (Fig. 36b) was built on this site in the 1920s for an individual by the name of McLain, a relative of the Pursley family. A major portion of the house has now collapsed. The north wall is the most complete and is composed of unworked but fairly regularly sized sandstone blocks, chinked with smaller, irregular fragments of the same material, and laid up using a high-sand-content mortar. A stone fireplace and chimney dominate the wall, and a hole in the chimney suggests that the fireplace was adapted for a wood-burning stove. Two pieces of wood were laid into the interior face of the chimney, and probably functioned as mailers or supports for a wooden mantel. The remaining walls of the structure have almost entirely collapsed. A stone water table extends around the building. A doorway frame is apparent on its east side, and eastward-jutting stone footings suggest that there was a wood frame extension on that side. Thus, the remains suggest a single-room stone house measuring 18.3 feet (5.6 meters) north-south by 11.5 feet (3.5 meters) east-west. A single stone-lined cistern lies to the immediate southeast of the house. There are no extant outbuildings.

Physiography: On a gentle upland slope, far to the east of Croton Creek.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Woodward very fine sandy loam, a Typic Ustochrept.

Vegetation: Dense cover of johnsongrass, threeawn and various forbs, with scattered mesquite.

Condition: The structure has almost entirely collapsed, with only a major portion of the north wall still standing. Most of the presumed



wooden components are absent, and it is likely that much of the original building stone has been salvaged from the ruins.

**Assessment:** The house is far too disturbed to be considered eligible for nomination to the National Register of Historic Places. Further investigations would not be likely to produce additional significant data, and the site will not be affected by reservoir construction as currently planned.

**Recommendations:** Further work is not felt to be scientifically productive at this time.

41KT27 (Pursley Housesite A; Dam Site 10, Outside Survey Area)

USGS Quadrangle: 7.5' Pursley House 1958

Elevation: 1825 feet/556 meters

Dimensions: 60 meters N-S by 60 meters E-W

**Location:** At the northern extremity of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site location appears on the published USGS quadrangle as a dwelling with one outbuilding and is labeled "Pursley House."

**Description:** Site 41KT27 was the second Pursley house, the first having been a small wood frame structure to the immediate south and which no longer exists. After its construction ca. 1900, 41KT27 served as the main Pursley home. The site originally consisted of a seven- or eight-room frame house raised on sandstone footings, a frame barn with associated corrals, and four stone-lined cisterns. The house has been destroyed, but the barn, corrals and cisterns are still intact. China, glazed pottery, Ferris brick, clear glass and metal fragments were observed on the surface.

**Physiography:** On a valley margin slope overlooking Croton Creek, 12 meters above the stream.

**Lithology:** Poorly consolidated sandstone, Whitehorse Group.

**Soil:** Enterprise very fine sandy loam, a Typic Ustochrept.

**Vegetation:** Moderately dense cover of short to mid grasses and forbs, with scattered mesquite and hackberry.

**Condition:** The house has been completely destroyed, but the other site features are in excellent condition.

**Assessment:** The house has been destroyed, and the remaining features are insufficiently remarkable in architectural terms to merit nomination to the National Register of Historic Places. 41KT27 will not be affected by reservoir construction as currently planned.

## APPENDIX I: DESCRIPTIONS OF RECORDED HISTORIC SITES

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT28 (Pursley Housesite B; Dam Site 10, Outside Survey Area)

USGS Quadrangle: 7.5' Pursley House 1958

Elevation: 1820 feet/558 meters

Dimensions: Undetermined

Location: At the northern extremity of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 4.08 kilometers southeast of the confluence of North Pole and South Pole creeks and 5.54 kilometers southwest of the Sage Tank outfall.

Description: 41KT28 is the former location of a small wood frame house constructed for G. A. and Georgia Gertrude McLain Pursley ca. 1900, after G. A. moved to the Croton Creek area with his father and brother and began acquiring ranch lands. Only a single, stone-lined cistern and a few sandstone blocks remain at the surface to indicate the former presence of the house.

Physiography: On a valley margin slope overlooking Croton Creek, 13 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Enterprise very fine sandy loam, a Typic Ustochrept.

Vegetation: Moderately dense cover of short to mid grasses with scattered mesquite.

Condition: The house has been completely destroyed; only an associated cistern survives.

Assessment: The site is far too disturbed to be considered eligible for nomination to the National Register of Historic Places. 41KT28 will not be affected by the reservoir construction as currently planned.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT29 (Tanksley Half-Dugout; Dam Site 10, Survey Unit A-29)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1790 feet/546 meters

Dimensions: Undetermined

**Location:** Near the center of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 3.28 kilometers southeast of the Coker Tank outfall and 0.64 kilometer east-northeast of the confluence of Short Croton and Croton creeks.

**Description:** The Tanksley half-dugout was constructed by Tom Tanksley at about the time of World War I to provide housing for hands who worked cattle and/or cultivated the fields to the south on Croton Creek. Trueman Murdoch lived in the dugout in the 1920s for a brief time and remembers that it had frame walls. At the present time the site is all but obliterated and would have been very difficult to discern had not Mr. Murdoch pointed it out. A remnant depression is located on the east side of a promontory overlooking Croton Creek, and the dugout faced roughly southeast. No ceramics or glass were noted, and the roof structure has completely disappeared. A few scattered fragments of wood and lumber were noted in the immediate vicinity of the former dugout.

**Physiography:** The half-dugout was excavated into the scarp of the 12-to-18-meter Croton Creek fill terrace.

**Lithology:** Mid to early Holocene alluvium, a very fine sandy loam in texture.

**Soil:** Site falls within the Woodward-Quinlan soils mapping unit. Soil of the immediate site area is a very fine sandy loam, classifiable as a Lithic Torriorthent.

**Vegetation:** Sparse cover of short grasses.

**Condition:** The site has been severely disturbed by sheet erosion.

**Assessment:** The half-dugout has been virtually destroyed by erosion, and very little cultural material remains on the site. Further investigations are not likely to produce additional significant data, and 41KT29 is far too disturbed to be considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

41KT30 (Unnamed Dugout; Dam Site 10, North of Survey Unit A-31)

**USGS Quadrangle:** 7.5' Jayton 1958

**Elevation:** 1810 feet/552 meters

**Dimensions:** 3 meters N-S by 3 meters E-W

**Location:** Near the center of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 3.37 kilometers southeast

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of the Coker Tank outlet and 0.8 kilometer east-northeast of the confluence of Short Croton and Croton creeks.

Description: A dugout which was constructed at about the time of World War I. The entrance is to the east. The roof has collapsed, but the dugout is otherwise in good condition. The roof structure is comprised of a center beam which runs east-west the length of the dugout, over which mesquite poles were laid at right angles. This roughly gabled structure was covered with corrugated metal and capped with a layer of gravelly soil. The dimensions of the dugout are approximately 10 feet (3 meters) by 10 feet (3 meters). Surrounding refuse is sparse and consists largely of clear glass.

Physiography: On the streamward edge of the 12-to-18-meter Croton Creek fill terrace.

Lithology: Mid to early Holocene alluvium, a gravelly very fine sandy loam in texture.

Soil: The site falls within the Woodward-Quinlan soils mapping unit. Soil of the immediate site area is a gravelly very fine sandy loam, classifiable as a Lithic Torriorthent.

Vegetation: Moderate cover of short to mid grasses and forbs with scattered mesquite.

Condition: The roof of the dugout has collapsed, and the walls at the entrance have slumped somewhat. Otherwise, the feature is reasonably intact.

Assessment: The dugout was occupied for a brief time ca. 1920. It is a vernacular architectural expression of which there are many other better-preserved examples in the general area. The site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KT31 (Tanksley Housesite; Dam Site 10, Survey Unit B-25)

USGS Quadrangle: 7.5' Jayton 1958

Elevation: 1820 feet/555 meters

Dimensions: 30 meters N-S by 30 meters E-W

Location: Near the center of the Dam Site 10 basin, along the middle reaches of Croton Creek. The site is 3.13 kilometers southeast of the Coker Tank outfall and 0.55 kilometer northeast of the confluence of Short Croton and Croton creeks.

## KING COUNTY SITES

**Description:** The site is the former location of a two-room frame house occupied by a Tom Tanksley in the 1920s. The house was destroyed many years ago. Two cisterns associated with the house are still visible but have collapsed and filled in. Scattered metal fragments are visible on the surface of the site.

**Physiography:** On the 12-to-18-meter Croton Creek fill terrace.

**Lithology:** Mid to early Holocene alluvium, a very fine sandy loam in texture.

**Soil:** Quinlan very fine sandy loam, a Typic Ustochrept.

**Vegetation:** Moderately dense cover of short to mid grasses and forbs with scattered mesquite.

**Condition:** Very poor; the house has been completely destroyed, and the associated cisterns have collapsed and are partially filled in.

**Assessment:** The site is not considered eligible for nomination to the National Register of Historic Places due to its poor condition, recent origins and lack of associations with a significant local figure.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

## KING COUNTY SITES

### 41KG43 (Windmill Site; Dam Site 19, Survey Unit A-132)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1500 feet/457 meters

**Dimensions:** 18 meters N-S by 30 meters E-W

**Location:** Near the center of the Dam Site 19 basin, along the lower reaches of North Croton Creek. The site is 3.73 kilometers northwest of the gaging station on North Croton Creek and 5.4 kilometers west of the northern end of the 6666 Ranch landing strip.

**Description:** 41KG43 consists of a fairly discrete scatter of historic cultural material with no extant structures or evidence of any kind of any former structure or habitation area. Local residents are not aware of any structure or camp having occupied the spot. The observed cultural material includes several spent brass revolver cartridge casings (Winchester .44 magnum), one spent paper and brass shotgun shell (Winchester 12 gauge), white stoneware and brown glazed earthenware sherds, and patinated bottle glass fragments.

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Physiography: On a small bedrock bench immediately adjacent to and approximately 1 meter above the North Croton Creek fill terrace.

Lithology: Dolomite, Blaine Formation.

Soil: The cultural material appears in a severely deflated area which is virtually devoid of soil.

Vegetation: Sparse cover of short grasses with scattered juniper, mesquite, catclaw and prickly pear.

Condition: The entire site area has been severely disturbed by sheet erosion, and most of the cultural material rests directly on dolomite bedrock.

Assessment: The cultural material at 41KG43 appears to date to the first half of the twentieth century. It is probable that a temporary camp or simple refuse dump is represented. The distribution of the cultural material has been severely disturbed by erosion. The information yield potential of 41KG43 is low, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG56 (Three Dugouts; Dam Site 19, Outside Survey Area)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1610 feet/491 meters

Dimensions: 10 meters N-S by 22 meters E-W

Location: North of the center of the Dam Site 19 basin, along the upper reaches of an unnamed left-bank tributary of North Croton Creek. The site is 5.94 kilometers north of the intersection of the King-Stonewall county line and North Croton Creek and 5.8 kilometers northwest of the northern end of the 6666 Ranch landing strip.

Description: Three dugouts were excavated into the scarp of a small upland slope. The dugouts are fairly evenly spaced 3 to 4 meters apart in a row, with their entrances facing southeast. The easternmost dugout, which is in relatively intact condition, was walled in at the front with drylaid tabular slabs of dolomite. A narrow doorway was located at the center of the wall. Roofing was probably of pole-and-earth construction, with dolomite slabs laid around the margins for stability. The dugouts are 9.8 to 11.5 feet (3 to 3.5 meters) in length, 8.2 to 9.8 feet (2.5 to 3 meters) in width, and 2.5 to 3.3 feet (.75 to 1 meter) in height from the present ground level to the tops of the standing rock walls. White stoneware sherds, purple and brown patinated bottle glass fragments, barbed wire fragments, and miscellaneous

oxidized iron scraps were observed to be washing downslope from the structures. There is a freshwater spring within 50 meters of the site.

Physiography: The dugouts were excavated into the scarp of a bed-rock bench overlooking a major left-bank tributary of North Croton Creek, 12 meters above the former stream.

Lithology: Weathered shales and clays, Blaine Formation.

Soil: The soil of the immediate site area is a clay loam, classifiable as a Lithic Ustorthent.

Vegetation: Moderate to sparse cover of juniper, threeawn, prickly pear and yucca, with scattered mesquite.

Condition: The site has been severely disturbed by sheet and rill erosion. The roofs of the structures have collapsed, and two of the dugouts have been entirely scoured of their fill by erosion.

Assessment: As a possible homestead site, this location is peculiar. It seems to have been chosen as much for its panoramic views and shelter from the wind as for any other possible factors. Although a spring is located nearby, there is no arable land in the vicinity. It seems possible that 41KG56 is an earlier, late nineteenth-century site associated with buffalo-hunting activities. The site as a whole is too disturbed to merit nomination to the National Register of Historic Places. However, should the site be threatened at some point in the future, removal of the fill of the single, relatively intact feature through controlled excavations should be considered. 41KG56 will not be disturbed by the reservoir construction as currently planned.

Recommendations: Further work is felt not to be scientifically productive at this time.

41KG60 (Martin Dugout; Dam Site 14, Outside Survey Area)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1825 meters/556 meters

Dimensions: 30 meters N-S by 30 meters E-W

Location: North of the Dam Site 14 basin, along the upper reaches of Southerland Canyon. The site is 4.54 kilometers southeast of the Bar S Ranch headquarters and 1.67 kilometers southwest of the Negro Tank outfall.

Description: A collapsed dugout overlooks the confluence of Southerland Creek and a small, spring-fed tributary. The entrance faces due south, and the dugout measures approximately 14.7 feet (4.5 meters) north-south by 16.3 feet (5 meters) east-west. The walls appear to have been constructed of selenite and sandstone; no roofing materials are now

## APPENDIX I: DESCRIPTIONS OF RECORDED HISTORIC SITES

visible. The remains of a rock chimney or vent are visible midway down the length of the west wall and indicate the existence of some cooking/heating apparatus at one time. An iron wagon wheel hub and fragments of china and sand-tempered glass were observed on the surface within and surrounding the dugout. A large level area located downslope of the dugout may be suitable for cultivation. According to Glen Springer, the dugout was the residence of William S. Martin when he first moved to the area and became involved with the Martin (Bar S) Ranch (presently the Springer Ranch). King County: Windmills & Barbed Wire (The King County Historical Society 1976:343) also identifies this as the residence of the Martin brothers in about 1911.

Physiography: On a valley margin slope overlooking Southerland Creek, 15 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Woodward very fine sandy loam, a Typic Ustochrept.

Vegetation: Sparse cover of short grasses, prickly pear and yucca, with scattered mesquite and juniper.

Condition: The roof of the dugout has collapsed, and the structure has been severely disturbed by erosion.

Assessment: Due to its severely deteriorated condition, 41KG60 is not considered eligible for nomination to the National Register of Historic Places. The site is well outside the bounds of the project area and will not be disturbed by the reservoir construction as currently planned.

Recommendations: Further work is felt not to be scientifically productive at this time.

### 41KG61 (Buffalo Hunter Camp; Dam Site 14, Outside Survey Area)

USGS Quadrangle: 7.5' Southerland Canyon 1958

Elevation: 1740 feet/530 meters

Dimensions: 30 meters N-S by 30 meters E-W

Location: At the northern margin of the Dam Site 14 basin, along the middle reaches of Haystack Creek. The site is 4.8 kilometers south of the Bar S Ranch headquarters and 6.32 kilometers east of Hackberry Windmill.

Description: The site is comprised of the remains of a stone structure, a stone wall which may have formed a corral, and a possible grave (Fig. 33). The structure is located on the east side of the site, and measures roughly 14.5 feet (4.4 meters) north-south by 16 feet (4.9 meters) east-west. Although the structure is rather overgrown and



partially buried, it appears to have been a surface feature rather than a dugout. Some 40 feet (12 meters) west and downslope of the structure, the east wall of an apparent rock corral is partially visible. The dimensions of the enclosure are not clear; much of the feature seems to be buried or collapsed and displaced. Short segments of the north and west walls are visible. On a portion of the east wall of the "corral" is a concentration of sandstone slabs measuring 9 feet (2.7 meters) north-south by 2.5 feet (0.76 meter) east-west. Local tradition identifies this feature as a grave, but the north-south orientation would be unusual for an Anglo burial. The only cultural material visible on the surface is a few scraps of wrought iron.

Physiography: On a valley margin slope overlooking Haystack Creek, 14 meters above the stream.

Lithology: Poorly consolidated sandstone, Whitehorse Group.

Soil: Woodward very fine sandy loam, a Typic Ustochrept.

Vegetation: Dense cover of mesquite, juniper, short and mid grasses, prickly pear and yucca.

Condition: The structure has apparently collapsed, but the cultural features appear to be otherwise intact and partially buried. The site has suffered very little erosion.

Assessment: Local tradition identifies 41KG61 as the site of an 1870s buffalo hunter camp and grave. It is not possible to assess either the function or the age of the site on the basis of present surface indications, but the suggested identification is certainly plausible. The site appears to be largely intact and probably has the potential to yield information about nineteenth-century activity in the area. 41KG61 may well be eligible for nomination to the National Register of Historic Places, but a more definitive assessment of the site will require exploratory excavations. The site is only 200 meters upstream of the reservoir basin boundary, and we believe 41KG61 to be of sufficient potential importance to merit further investigation.

Recommendations: Excavations of a limited and exploratory nature should be conducted to assess the integrity, function and cultural affiliation of site 41KG61 and to more accurately document its internal structure.

41KG63 (Brown House; Dam Site 19, South of Survey Unit B-95)

USGS Quadrangle: 7.5' Kiowa Peak NW 1967

Elevation: 1625 feet/495 meters

Dimensions: Undetermined

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**Location:** At the western extremity of the Dam Site 19 basin, along the middle reaches of Pen Branch. The site is 4.21 kilometers north of the JMA Ranch headquarters and 6.81 kilometers west of the Pen Branch Tank outfall.

**Description:** According to local informants, 41KG63 was the site of a wood frame house for about two years during the early 1900s. The material evidence that a house once stood on the site is limited to a few wood scraps and wire fragments scattered over an area of approximately 25 square meters that appears to have been bulldozed. Documentary evidence suggests that the headquarters for the Call Bar and/or Parramore ranches may have been located at this or a nearby site.

**Physiography:** On a valley margin slope overlooking Pen Branch, 10 meters above the stream.

**Lithology:** Weathered shales and clays, Blaine Formation.

**Soil:** Owens clay loam, a Typic Ustochrept.

**Vegetation:** Sparse cover of juniper and short grasses.

**Condition:** The presumed structure has been completely destroyed.

**Assessment:** Further investigations are not likely to produce additional significant data, and 41KG63 is certainly far too disturbed to be considered eligible for nomination to the National Register of Historic Places.

**Recommendations:** Further work is felt not to be scientifically productive at this time.

### STONEWALL COUNTY SITES

#### 41SN26 (Bradley Site; Dam Site 19, Survey Unit A-169)

**USGS Quadrangle:** 7.5' Kiowa Peak NE 1967

**Elevation:** 1530 feet/466 meters

**Dimensions:** 250 meters N-S by 200 meters E-W

**Location:** At the eastern end of the Dam Site 19 basin, along the lower reaches of North Croton Creek. The site is 0.75 kilometer north-northeast of the North Croton gaging station and 3.55 kilometers southwest of the northern end of the 6666 Ranch landing strip. The locations of the Bradley house and the main outbuildings are shown on the published USGS quadrangle.

**Description:** The site is comprised of two houses, one barn and miscellaneous sheds and corrals associated with several refuse deposits in ravines to the southeast and the west. Artifacts in the latter

deposits include windowglass fragments, empty bottles, miscellaneous stove parts, pots and pans, and metal cans. The main house is now occupied by Bandy Bradley, operator of the Long Ranch, and is a wood frame structure no more than 30 to 40 years old. It was built on the site of a central hall-type frame house which burned in 1941. East of the Bradley home is another frame house with an enclosed porch on the south side which appears to have been built in the 1920s or 1930s. A barn of the same vintage--a frame structure set on cement footings--is located north of the Bradley home; pens and corrals tie into the structure on the south and east. According to Mr. Bradley, the original house on the site was built by A. P. Oliver, a Stonewall County clerk, in about 1900. The house in which Bradley lives was built by C. B. Long.

Physiography: On a broad, nearly level upland slope at the northern edge of the North Croton Creek valley, 22 meters above the stream.

Lithology: Weathered shale, San Angelo Formation.

Soil: Vernon clay loam, a Typic Ustochrept.

Vegetation: The area surrounding the house is largely occupied by cultivated fields, livestock handling areas, and artificially maintained lawns and trees.

Condition: Excellent; house complex is still inhabited and in active use.

Assessment: The structures on the site are of recent construction and are architecturally unremarkable. Further investigations are not likely to produce additional significant data, and the site is not considered eligible for nomination to the National Register of Historic Places.

Recommendations: Further work is felt not to be scientifically productive at this time.

41SN71 (Wedington Spring; Dam Site 19, Outside Survey Area)

USGS Quadrangle: 7.5' Kiowa Peak SW 1967

Elevation: 1600 to 1620 feet/488 to 494 meters

Dimensions: 140 meters N-S by 140 meters E-W

Location: At the southwestern extremity of the Dam Site 19 basin, along the upper reaches of Wedington Creek. The site is 9.17 kilometers east of the intersection of U.S. 83 and FM 1263 and 7.9 kilometers northeast of the Mount Olive Cemetery.

Description: The presently visible features of the site are a series of stock-handling pens and corrals and a freshwater spring. According to local residents, the site has been used as a cattle camp by

## APPENDIX I: DESCRIPTIONS OF RECORDED HISTORIC SITES

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ranchers and cowboys for the better part of a century. The pens and fencing have been replaced many times, and the spring has been dredged to enlarge the drinking area for the cattle (Fig. 31a). Otherwise, the area appears little disturbed. The bench to the west of the spring has been used by cowboys as a camping area for many years. At least one cake house and a shallow well were also present in that area at one time. The quality and quantity of water issuing from the spring have apparently been the cause of at least one conflict between ranchers whose holdings abutted in the vicinity. A property line intersects the site at the present time; the neighboring ranchers share in both the use and the maintenance of the area. As discussed in the text, the spring may have been visited by Albert Pike in 1832.

**Physiography:** The spring emerges from the floor of the narrow Wedington Creek floodplain, less than 1 meter above the channel. The pens and purported camping area occupy a broad, nearly level bedrock bench to the immediate northwest, approximately 6 meters above the stream.

**Lithology:** A fairly deep (ca. 1 meter) mantle of weathered clay overlying dolomite of the Blaine Formation on the bench; a shallow mantle of recent alluvium occupies the stream bottom.

**Soil:** Owens clay loam, a Typic Ustochrept.

**Vegetation:** There is a dense growth of cattails, marshgrass, saltcedar and hackberry around the spring and along the stream issuing from it; the bench is occupied by a moderately dense cover of short to mid grasses and forbs, mesquite and juniper.

**Condition:** The vicinity of the spring has been disturbed by dredging, but the adjacent bench is densely overgrown and shows little evidence of erosion.

**Assessment:** It seems likely that intact, shallowly buried cultural remains relating to repeated historic Anglo, and possibly prehistoric aboriginal, use of the site occupy the bench to the northwest of the spring. The soil atop that landform appears to be entirely intact, and no deflation of any cultural deposits which may be present is expected on the basis of surface indications. If further field investigations and/or archival research can establish the connection with the Pike expedition more conclusively, the site will certainly merit nomination to the National Register of Historic Places. 41SN71 is only 200 meters upstream of the proposed reservoir boundary, and we believe the potential importance of the site is sufficient to warrant further investigation.

**Recommendations:** Excavations of a limited and exploratory nature should be conducted on the bench to the northwest of the spring to test for the presence of shallowly buried cultural remains. Further, a careful comparison of the documentary account of the Pike expedition to the topography along Wedington Creek may permit a more conclusive assessment of that historical connection.

41SN72 (Portwood-Halsell Dugout; Dam Site 19, Survey Unit A-169)

USGS Quadrangle: 7.5' Kiowa Peak NE 1967

Elevation: 1490 feet/454 meters

Dimensions: 4 meters NE-SW by 8 meters NW-SE

Location: At the eastern end of the Dam Site 19 basin, along the lower reaches of North Croton Creek. The site is 0.87 kilometer north of the gaging station on North Croton Creek and 3.58 kilometers southwest of the north end of the 6666 Ranch landing strip.

Description: A fairly large historic dugout, measuring approximately 14 feet (4.3 meters) northeast-southwest by 25 feet (7.6 meters) northwest-southeast (Fig. 35). The entrance faces to the southeast. No roofing materials are visible, and some slumping has occurred along the earth walls of the dugout. However, a stone-lined fireplace and flue in the center of the back (northwestern) wall are relatively intact. Patinated glass fragments were observed on the surface surrounding the dugout. The site is well-sheltered and is in close proximity to large areas of arable land. Relatively fresh water is available through the digging of shallow wells. According to Bandy Bradley, the dugout was constructed and used as a camp by W. H. Portwood and J. G. Halsell, who mostly ran horses and colts, possibly in the late 1880s. Bradley recalls that, as an elderly man, Portwood visited in the 1920s from his home of that time in Seymour and related the history of the dugout.

Physiography: The dugout was excavated into the scarp of a low bedrock bench approximately 1 meter above and immediately adjacent to the North Croton Creek terrace, 8 meters above the stream itself.

Lithology: Weathered shale, Choza Formation.

Soil: Owens clay loam, a Typic Ustorthent.

Vegetation: Moderately dense growth of hackberry, mesquite and various short to mid grasses.

Condition: The roof of the dugout has collapsed and the walls have slumped somewhat, but the feature is otherwise intact. The surface surrounding the dugout exhibits little evidence of erosion.

Assessment: The site appears relatively undisturbed and may have a high potential for yielding information about early ranching activity and material culture. It is possible that 41SN72 may represent one of the earliest known ranching sites in the project area and may date to a period about which few specific facts are known in the Kent-King-Stonewall county area. The site may well be eligible for nomination to the National Register of Historic Places, but further field investigations and documentary research are necessary for a conclusive assessment to be made.

## APPENDIX II: UNRECORDED HISTORIC SITES

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Recommendations: The dugout should be cleared in controlled excavations and carefully documented. Excavations of a limited and exploratory nature should be conducted in the immediate vicinity of the dugout to test for the presence of buried cultural material. It is further recommended that additional documentary research into the history of the activities of Portwood and Halsell be conducted.

### 41SN73 (Kiowa Peak Copper Mine; Dam Site 19, Survey Unit B-197)

USGS Quadrangle: 7.5' Kiowa Peak 1962

Elevation: 1540 to 1560 feet/469 to 476 meters

Dimensions: Undetermined

Location: At the southeastern extremity of the Dam Site 19 basin, along the middle reaches of Smelter Canyon. The site is 2.22 kilometers west-northwest of Kiowa Peak and 6.27 kilometers northwest of the confluence of Panther Creek and the Brazos River.

Description: The site consists of scattered large-dimension lumber fragments, talus and numerous copper sulphate fragments (Fig. 31b). It appears that the northern extreme of a bluff above Smelter Creek was mined, but the total area involved does not seem large. According to an informant, men from New York City initiated work on the mine as part of an investment scheme. Apparently the mine was only operated for a short period around the time of World War II. Soon after its closing, the engine and other apparatus, made in Webb City, were removed and set up on the County Courthouse lawn in Aspermont.

Physiography: On a valley margin slope overlooking Smelter Creek, 3 to 11 meters above the stream.

Lithology: Poorly consolidated sandstone interbedded with gypsum, Blaine Formation.

Soil: The site falls within the Owens-Badland Association mapping unit. Where soil is present, it is a fine sandy loam classifiable as a Lithic Torriorthent. Bedrock is exposed over most of the site area.

Vegetation: Scattered juniper and clumps of bunch grasses, with little other vegetation.

Condition: The site has been severely disturbed by sheet, rill and gully erosion and recent oilfield activity.

Assessment: No mining equipment remains and the site has been severely disturbed. However, the possible associations of the site with the history of early copper mining in King and Stonewall counties should be investigated. The site cannot be considered eligible for nomination to the National Register of Historic Places, but further investigations

could certainly produce additional data of significance to an interpretation of the history of the project area.

Recommendations: 41SN73 should be revisited during the course of the full inventory survey. Despite the severe disturbance of the site, it may be possible to document intrasite mining activity areas. Further documentary research in the mineral lease records of the Stonewall County Courthouse and the incorporation records of the Office of the Secretary of State in Austin may also shed some light on the history of the site.

TABLE 36

## SUMMARY OF RECORDED HISTORIC SITE DESCRIPTIONS, ASSESSMENTS AND RECOMMENDATIONS

| Site No. | Location    | Description                                     | Assessment                              | Recommendations                             |
|----------|-------------|---|---|---|
| 41KT12   | Dam Site 10 | Historic housesite                              | Virtually destroyed;<br>low potential   | No work at this time                        |
| 41KT20   | Dam Site 10 | Historic house, cistern<br>and outbuildings     | Relatively intact;<br>limited potential | Photographs and architectural documentation |
| 41KT22   | Dam Site 10 | Historic housesite and<br>cistern               | Extensively disturbed;<br>low potential | No work at this time                        |
| 41KT27   | Dam Site 10 | Historic housesite,<br>outbuildings and cistern | Partially destroyed;<br>low potential   | No work at this time                        |
| 41KT28   | Dam Site 10 | Historic housesite and<br>cistern               | Partially destroyed;<br>low potential   | No work at this time                        |
| 41KT29   | Dam Site 10 | Half-dugout                                     | Destroyed; low<br>potential             | No work at this time                        |
| 41KT30   | Dam Site 10 | Dugout  | Essentially intact;<br>low potential    | No work at this time                        |
| 41KT31   | Dam Site 10 | Historic housesite and<br>cisterns              | Virtually destroyed;<br>low potential   | No work at this time                        |
| 41KG43   | Dam Site 19 | Historic artifact scatter                       | Severely disturbed;<br>low potential    | No work at this time                        |



TABLE 36, continued

| Site No. | Location    | Description                               | Assessment                                | Recommendations                      |
|----------|-------------|---|---|--------------------------------------|
| 41KG56   | Dam Site 19 | Three dugouts                             | Disturbed;<br>limited potential           | No work at this time                 |
| 41KG60   | Dam Site 14 | Dugout                                    | Severely deteriorated;<br>low potential   | No work at this time                 |
| 41KG61   | Dam Site 14 | Historic house, corral<br>and grave site  | Essentially intact;<br>high potential     | Limited excavation                   |
| 41KG63   | Dam Site 19 | Historic housesite                        | Virtually destroyed;<br>low potential     | No work at this time                 |
| 41SN26   | Dam Site 19 | Historic houses,<br>outbuildings and dump | Excellent condition;<br>low potential     | No work at this time                 |
| 41SN71   | Dam Site 19 | Historic pens and<br>corrals, spring      | Intact; high potential                    | Limited excavation                   |
| 41SN72   | Dam Site 19 | Dugout                                    | Relatively undisturbed;<br>high potential | Documentation,<br>limited excavation |
| 41SN73   | Dam Site 19 | Historic copper mine site                 | Severely disturbed;<br>limited potential  | Documentation                        |

APPENDIX II: Unrecorded Historic Sites

Martha Doty Freeman

## INTRODUCTION

The following appendix provides information pertaining to historic sites in the Brazos Natural Salt Pollution Control Project area which are known by the author to exist, but which were not precisely located and recorded due to the constraints of limited field time. The existence and general locations of the sites were derived from interviews with local informants or in documentary research. Effort should be made during the course of the full inventory survey to locate, record and assess each of these sites.

## UNRECORDED HISTORIC SITES

### Putoff Canyon

An official Texas Historical Marker in Kent County on State Highway 70, approximately 3 miles northwest of Jayton, suggests that the canyon was named for an early resident of the county, was noted for the presence of a strong freshwater spring, was the site of an artists' resort from 1900 to 1914, and was the setting for Zane Grey's novel The Thundering Herd. However, careful examination of the materials in the Texas Historical Commission Historic Marker files used to produce the marker revealed no conclusive evidence to support any of these statements other than the presence of a freshwater spring. Local interviews and legal research conducted by the author in 1981 also failed to provide supporting evidence. However, it is suggested that an attempt be made to locate the spring, as this seems to offer a strong likelihood of association with early historic or aboriginal sites.

### Confederate Salt Works

A Confederate Memorial Information Marker commemorating the Double Mountain Salt Works is located adjacent to the Kent County Courthouse in Jayton. The marker notes the existence of a salt works under the control of the Texas Military Board, but fails to state the exact location of the site. Correspondence in the Historic Marker files in Austin with Kent County Judge D. J. Young indicated that the works were located on the broad salt flat at the head of Short Croton Creek. However, interviews with area residents (Murdoch 1981; Pursley 1981; Springer 1981) indicate that the only exploitable salt deposits are to be found among the tributaries of Salt Croton Creek, primarily Salt Flat and Haystack creeks, on the Martin-Springer (Bar S) Ranch in southern King and northern Stonewall counties, where salt has been collected since at least the early twentieth century.

### Murdoch Dugout and Housesite

According to Trueman Murdoch (1981), a dugout was constructed in the 1890s by his parents, Thomas Elliott and Eva Edwards Murdoch, along Cottonwood Canyon in Kent County, south of the present-day home of Bill

## APPENDIX II: UNRECORDED HISTORIC SITES

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Parks. The couple later moved a short distance down canyon and constructed a one-room rock house of selenite.

### Pursley House

The site of the first Pursley house, constructed by George P. Pursley and his two sons, G. A. (Barry) and W. M. (Sell) Pursley, was on Croton Creek in Kent County on the northern end of a cultivated field a short distance to the south-southeast of site 41KT27 (Pursley 1981). This frame structure probably dated from the 1890s and was moved to 41KT27 ca. 1900 for use as a kennel.

### Patterson Ranch Burials

The graves of two children are apparently located on Croton Creek in eastern Stonewall County in the vicinity of the Croton Pens on the Patterson Ranch. An informant (Nuding 1981) was unable to identify the children by name but indicated that the dam construction at Dam Site 10 might disturb the burials.

### Jefferson Davis Patterson Dugout

The J. D. Patterson dugout and rock pens are located in a branch of Seven Diamond L Canyon and on the adjacent canyon rim. Both features were originally constructed by the Lanier Family and were used by Patterson in the late 1880s (Nuding 1981; Patterson 1981; Stonewall County Historical Commission 1979:251). They are among the earliest historic sites in northwestern Stonewall County and are associated with the activities of one of the county's most prominent ranching families. If reasonably intact, the site will probably be eligible for nomination to the National Register of Historic Places.

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REVIEW COMMENTS AND RESPONSES

by

Elton R. Prewitt

## INTRODUCTION

In their letter accepting the draft final report for this project, the Corps of Engineers stipulated that the final printed report should include a copy of the comments received from the State Historic Preservation Officer (SHPO) and our responses to the comments. In accordance with this requirement, the letter we received from the SHPO is reproduced on the following page.

### RESPONSES TO STATE HISTORIC PRESERVATION OFFICER COMMENTS

The SHPO disagrees with the National Register of Historic Places (NRHP) assessments for 13 sites discussed in the report. It is the opinion of the SHPO that these 13 sites are potentially eligible for nomination to the NRHP while our assessments were generally contrary to that opinion. In order to address the SHPO comment, the sites are segregated into prehistoric and historic groupings in keeping with the format of the report.

#### Prehistoric Sites (8)

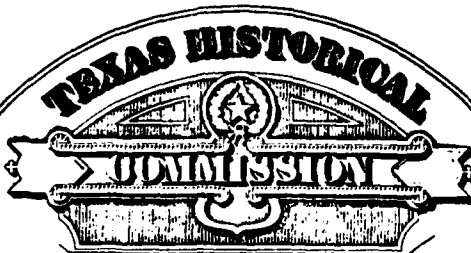
One prehistoric site (41SN12) is recommended for controlled surface sampling and seven (41KT11, 41KT12, 41KT16, 41KT19, 41KG24, 41SN42 and 41SN55) are recommended for uncontrolled surface collection. The NRHP assessment of each site is based on that site's individual merits. The physical integrity of each site is such that they are not felt to be of National Register quality in comparison to the other sites documented in the project area. However, we feel that in order to more fully understand the lithic procurement and lithic processing system(s) which prevailed in the project area, a sample of sites which lack physical integrity should be subjected to surface collection to provide comparative data for those sites recommended for more intensive investigation. The eight sites in question represent our carefully considered judgment of the sites from which these data should be collected.

The SHPO is correct in a strict application of the criterion cited that the sites ". . . may be likely to yield information important in prehistory or history . . . ." Obviously, we feel there is information to be gained from sampling the sites or we would not have recommended the additional work. Yet, we hesitate to suggest the sites are eligible for nomination to the NRHP because of their lack of physical integrity, and this is reflected in our less strict application of the NRHP criterion cited above and by the SHPO.

In direct response to the SHPO's comment, we stand with our original assessments and recommendations and have left them unchanged in the final printed report. However, we recognize the fact that, as an aggregate, the eight sites do contain potentially significant information.

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TELEPHONE  
 (512) 475-3092

March 30, 1982

Mr. D.L. Mills, Chief  
 Planning Branch  
 Fort Worth District, Corps  
 of Engineers  
 P.O. Box 17300  
 Fort Worth, Texas 76102

Dear Mr. Mills:

We have received and reviewed a draft copy of the report, "A Preliminary Assessment of the Cultural Resources in the Brazos Natural Salt Pollution Abatement Project, Kent, King, and Stonewall Counties, Texas". This scholarly report will serve as an important information source for the region. However, the State Historic Preservation Officer cannot agree with all the recommendations as set out in the report, pages 117 through 126 and Part 2, pages 559 through 563. It is our opinion that the following prehistoric and historic sites are potentially eligible for the National Register and should be tested for eligibility status: 41KT11, KT12, KT16, KT19, KT20, 41KG24, KG61, 41SN12, SN42, SN55, SN71, SN72, and 41SN73. Following the criteria for evaluation for the National Register, these sites, "... may be likely to yield information important in prehistory or history" (36 C.F.R., Part 60.6), because in this area there is a paucity of systematically gathered information, a dearth of controlled excavations on sites, and a lack of artifact collections, which in sum provide an important data base.

We look forward to participating in the continued review of this report.

Sincerely,

Curtis Tunnell  
 Acting State Historic Preservation  
 Officer

by

*LaVerne Herrington*  
 LaVerne Herrington, Ph.D.  
 Director  
 Resource Conservation

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APR 01 1982

PEP/LH/lft

cc: Elton Prewitt

*The State Agency for Historic Preservation*

In view of this, we capitulate to the SHPO's judgment that the sites are potentially eligible for nomination to the NRHP and concur in that opinion.

Historic Sites (5)

A single historic site (41KT20) was assessed to be not eligible for NRHP nomination but was recommended for detailed recording. In and of itself, there is nothing outstanding which would indicate that site 41KT20 is eligible for the NRHP. When considered on a regional basis, the site is typical of other historic sites and can contribute to an understanding of the historic use of the region. As with the prehistoric sites discussed above, the importance of the site lies in the aggregate, not in the individual. We concur with the SHPO determination that the site is potentially eligible for nomination to the NRHP and our recommendation for recording remains unchanged.

Three of the remaining sites, 41KG61, 41SN71 and 41SN72, are assessed as potentially eligible for nomination to the NRHP and there is no conflict with the comment made by the SHPO. The final site, 41SN73, lacks physical integrity. However, in view of the fact it may be important to the early mining industry of the region, the SHPO is correct in determining that it is potentially eligible for nomination to the NRHP and we concur in that opinion.

